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(54) Title: PNI MICROARRAY AND USES

(57) Abstract: Disclosed are compositions and methods for microarrays comprising genes involved in psychoneuroendocrinimmune (PNI) activity.

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PNI MICROARRAY AND USES

I. BACKGROUND OF THE INVENTION

1. One of the challenges encountered in the design of clinical studies of complex diseases, particularly those with a neurological component, is obtaining informative samples. Even the most cooperative subjects are reluctant to provide neurological samples, and collecting such samples at multiple time-points is simply not feasible. In contrast, peripheral blood is a readily available clinical sample. Many studies have assayed peripheral blood for specific hormones (both peptide and steroid), antibodies, or serum proteins, forming the basis of the understanding of the ongoing communication between the nervous, endocrine, and immune systems.

2. This sort of analysis is unfortunately confounded by the fact that most neurotransmitters and hormones are produced and act at sites distinct from the peripheral blood. Also, the microenvironment of the brain is protected by the blood-brain barrier, a lipid membrane that is formed by tight junctions between endothelial cells lining blood vessels in the brain. This barrier allows transport of gases and, by facilitated diffusion, metabolically necessary molecules such as glucose and amino acids. It excludes most large molecules and cells, both bacterial and immune, under normal conditions (Paulson, 2002).

II. SUMMARY OF THE INVENTION

3. In accordance with the purposes of this invention, as embodied and broadly described herein, this invention, in one aspect, relates to psychoneuroendocrinimmune (PNI) microarrays.

4. Additional advantages of the invention will be set forth in part in the description which follows, and in part will be obvious from the description, or can be learned by practice of the invention. The advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims. It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

III. BRIEF DESCRIPTION OF THE DRAWINGS

5. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and together with the description, serve to explain the principles of the invention.

6. Figure 1 shows the hypothalamus-pituitary-adrenal HPA axis that is vital to appropriate pscyhoneuroendocrinimmune (PNI) response. The complex feedback loop is simplified here to demonstrate the basic components of the HPA axis. The paraventricular nucleus (PVN) of the Hypothalamus secretes corticotropin releasing factor (CRF), also known as corticotropin releasing hormone (CRH), in response to various stressors. This stimulates the corticotrope of the pituitary to release adrenocorticotropic hormone (ACTH), which then acts on the adrendal fasciculata of the adrendals to release of glucocorticoid hormones, such as cortisol. Cortisol completes the feedback loop by inhibiting the release of CRF and ACTH.

7. Figure 2 shows the Composition of an example of the present PNI microarray. 1451 genes were selected for analysis either because they have known or suspected roles in endocrine (24%), nervous (14%), or immune (40%) systems or because changes in their regulation would affect at least one of those systems (22%).

8. Figure 3 shows that Nimblegen Microarrays are compatible with the array technology. Replicates of a) Caski cells or PBMCs show reproducible patterns of gene expression. b) The larger spots on the 85K format are amenable to analysis. Shown is a sample data file from Nimblegen with an Arrayvision overlay in red.

9. Figure 4 shows that blood was collected and RNA was isolated using either A standard methods (collection in EDTA tubes; no stabilization; RNA isolation using a guanidinium-based method), or B the PAX gene Blood RNA System (for RNA stabilization and isolation). The graphs show changes in expression of 12 genes after blood collection, measured using real-time RT-PCR. Source Precision Medicine, Boulder, Colorado, USA.) (Figure & Text from Qiagen Website)

10. Figure 5 shows that bioinformatic analysis reveals that many psychoneuroendocrinimmune genes are expressed in peripheral blood. A) 1451 genes were selected for analysis either because they have known or suspected roles in endocrine (24%), nervous (14%), or immune (40%) systems or because changes in their regulation would affect at least one of those systems (other; 22%). B) 505 of the selected genes were represented by expressed sequence tags (ESTs) in a database constructed from nine blood-derived EST libraries. As expected, a large proportion of these were genes encoding immune system proteins (52%), or classified as "other" (26%), but genes encoding proteins with endocrine (17%) or (5%) nervous system functions were also detected in peripheral blood.

11. Figure 6A shows 1451 genes were selected for analysis either because they have known or suspected roles in endocrine (24%), nervous (14%), or immune (40%) systems or because changes in their regulation would affect at least one of those systems (other; 22%). Figure 6B shows that 505 of the selected genes were represented by expressed sequence tags (ESTs) in a database constructed from nine blood-derived EST libraries. As expected, a large proportion of these were genes encoding immune system proteins (52%), or classified as "other" (26%), but genes encoding proteins with endocrine (17%) or (5%) nervous system functions were predicted to be detectable in peripheral blood.

12. Figure 7 shows an example of a microarray layout.

13. Figure 8 shows an example of a microarray plate design.

14. Figure 9 shows the dilutions for the exemplified microarray.

15. Figure 10 shows the genes used in the exemplified microarray and their GenBank® accession numbers. Genes were categorized by system and a count of the total number of genes per system and the relative percentage is given.

16. Figure 11 shows the raw data achieved from the microarray.

17. Figure 12 shows an analysis of the raw data in particular revealing the differential expression of various genes.

18. Figure 13 shows the development of the PNI gene list: Information from a variety of sources was consolidated (A) and the resulting genes were categorized (B). Genes that are categorized as "other" encode proteins with known roles in several of the systems.

19. Figure 14 shows that the expression of 301 PNI genes in peripheral blood was verified by both Microarray data and the presence of matching sequences in an EST database derived from cDNAs isolated in blood. Evidence for expression of additional PNI genes was found either by microarray alone (511) or by matching ESTs alone (214). 51 genes indicated by the EST data to be expressed in blood had no detectable expression on the microarray. In this figure, expression by microarray for a given gene is confirmed when at least 75% of the features have a signal-to-noise ratio greater than 2.5.

20. Figure 15 shows that approximately 10 percent of genes were never expressed, a small number are expressed by only a few subjects, and the bulk of the genes are expressed by most or all of the subjects. A uniform distribution would have

raised concerns about the 75% cut-off value used in figure 2. The observed distribution instead suggests that individual variability will not be a confounding factor for gene expression profiling using peripheral blood. Also, it was possible that distributions would differ between the categories of genes. However, the proportion of genes expressed in none, some, or all of twenty microarrays prepared using PBMC-derived mRNA was similar for genes categorized as Neuronal or Endocrine as it was for genes categorized as Immune. This is additional evidence that expression of Neuronal or Endocrine genes in blood is meaningful, and suggests it will be possible to use blood to examine the status of an individual's overall PNI functioning.

21. Figure 16 shows scatterplot matrices and Pearson's correlations using log2 Normalized sARM data extracted using Arrayvision. The data has been "de-convoluted", so each point represents a comparison of a specific probe on one replicate array with the corresponding probe on another array, regardless of their actual geographic position. Additionally, probes where the sARMdens/background ratio was less than 2.5 for all three replicates were excluded (approx 30% of probes).

22. Figure 17 shows Ranges (in bold) and box plots (in black) of log2 transformed sARM signal intensity for each of the three replicate PNI arrays. The grand mean is denoted by the dotted gray line Blanks are excluded.

IV. DETAILED DESCRIPTION

23. The present invention can be understood more readily by reference to the following detailed description of preferred embodiments of the invention and the Examples included therein and to the Figures and their previous and following description.

24. Before the present compounds, compositions, articles, devices, and/or methods are disclosed and described, it is to be understood that this invention is not limited to specific synthetic methods, specific recombinant biotechnology methods unless otherwise specified, or to particular reagents unless otherwise specified, as such can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting.

A. Definitions

25. As used in the specification and the appended claims, the singular forms "a," "an" and "the" include plural referents unless the context clearly dictates otherwise. Thus, for example, reference to "a pharmaceutical carrier" includes mixtures of two or more such carriers, and the like.

26. Ranges may be expressed herein as from "about" one particular value, and/or to "about" another particular value. When such a range is expressed, another embodiment includes from the one particular value and/or to the other particular value. Similarly, when values are expressed as approximations, by use of the antecedent "about," it will be understood that the particular value forms another embodiment. It will be further understood that the endpoints of each of the ranges are significant both in relation to the other endpoint, and independently of the other endpoint.

27. In this specification and in the claims which follow, reference will be made to a number of terms which shall be defined to have the following meanings:

28. "Optional" or "optionally" means that the subsequently described event or circumstance may or may not occur, and that the description includes instances where said event or circumstance occurs and instances where it does not.

29. "Primers" are a subset of probes which are capable of supporting some type of enzymatic manipulation and which can hybridize with a target nucleic acid such that the enzymatic manipulation can occur. A primer can be made from any combination of nucleotides or nucleotide derivatives or analogs available in the art which do not interfere with the enzymatic manipulation.

30. "Probes" are molecules capable of interacting with a target nucleic acid, typically in a sequence specific manner, for example through hybridization. The hybridization of nucleic acids is well understood in the art and discussed herein. Typically a probe can be made from any combination of nucleotides or nucleotide derivatives or analogs available in the art. For the purposes of microarrays discussed herein, a "probe" is the tethered nucleic acid with known sequence, whereas a "target" is the free nucleic acid sample whose identity/abundance is being detected.

B. Microarrays

31. Due to the complexity of PNI interactions occurring between immune, endocrine, and nervous systems, assays for one or a few biomolecular markers can be uninformative or misleading. Accordingly, diseases that are characterized by

disturbances in PNI homeostasis or response are among the most significant research and clinical challenges. Gene expression profiling of the most readily available clinical sample, peripheral blood, can be informative in characterizing PNI dysfunction. A bioinformatic analysis of peripheral blood expression of 1451 PNI genes, selected with the intention of elucidating biological pathways, supports this view and its application with other or additional genes. Implications of peripheral blood expression of the PGRMC1 hormone receptor, the hormone responsive protein ZNF147, and several (GABA)ergic system proteins are discussed in detail. Herein disclosed are microarrays comprising genes involved in pscyhoneuroendocrinimmune (PNI) activity.

1. Chips and microarrays

32. Herein an "array," "microarray," or "DNA chip" refers to an orderly arrangement of probes that provides a medium for matching known and unknown DNA samples and automated process of identifying the unknowns. An array experiment can make use of microplates or standard blotting membranes, and can be created by hand or make use of robotics to deposit the probes. Typically, arrays are described as macroarrays or microarrays. Macroarrays contain sample spot sizes of about 300 microns or larger. The sample sizes in microarray are 300 or less microns but typically less than 200 microns in diameter. Microarrays can utilize specialized robotics and/or imaging equipment to enhance throughput and visualization of data. Terminologies that have been used in the literature to describe this technology include, but not limited to: biochip, DNA chip, DNA microarray, GeneChip® (Affymetrix, Inc., which refers to its high density, oligonucleotide-based DNA arrays), and gene array.

33. DNA microarrays or DNA chips are generally fabricated on glass but can be made on nylon substrates or other membranes. An experiment with a single DNA chip can provide researchers information on thousands of genes simultaneously. It is herein contemplated that the disclosed microarrays can be used for gene expression monitoring, disease diagnosis, gene discovery, drug discovery (pharmacogenomics), and toxicological research or toxicogenomics which is the hybridization of functional genomics and molecular toxicology.

34. Two variants of the DNA microarray technology, in terms of the property of arrayed DNA sequence with known identity are known to exist:

Format I: probe cDNA (500~5,000 bases long) can be immobilized to a solid surface such as glass using robot spotting and exposed to a set of targets

either separately or in a mixture and is typically referred to as "DNA microarray."

Format II: Called "DNA chips," this format comprises an array of oligonucleotide (20~80-mer oligos) or peptide nucleic acid (PNA) probes is synthesized either in situ or by conventional synthesis followed by immobilization. Labeled sample DNA is then hybridized to the array, and the identity/abundance of complementary sequences are determined.

35. The basic concept behind the use of DNA microarrays or DNA chips for gene expression is well known in the art. Typically, labeled cDNA or cRNA targets derived from the mRNA of an experimental sample are hybridized to nucleic acid probes attached to the solid support. By monitoring the amount of label associated with each DNA location, the abundance of each mRNA species represented can be determined.

36. The manufacture of DNA microarrays uses photolithography and solid-phase chemistry to produce arrays containing hundreds of thousands of oligonucleotide probes packed at extremely high densities. The probes are designed to maximize sensitivity, specificity, and reproducibility, allowing consistent discrimination between specific and background signals, and between closely related target sequences.

37. DNA microarray manufacturing can start with a quartz wafer. Initially the quartz is washed to ensure uniform hydroxylation across its surface. Because quartz is naturally hydroxylated, it provides an excellent substrate for the attachment of chemicals, such as linker molecules, that are later used to position the probes on the arrays.

38. The wafer is placed in a bath of silane, which reacts with the hydroxyl groups of the quartz, and forms a matrix of covalently linked molecules. The distance between these silane molecules determines the probes' packing density, allowing arrays to hold over 500,000 probe locations, or features.

39. Probe synthesis occurs in parallel, resulting in the addition of an A, C, T, or G nucleotide to multiple growing chains simultaneously. To define which oligonucleotide chains will receive a nucleotide in each step, photolithographic masks, carrying 18 to 20 square micron windows that correspond to the dimensions of individual features, are placed over the coated wafer. The windows are distributed over the mask based on the desired sequence of each probe. When ultraviolet light is shone

over the mask in the first step of synthesis, the exposed linkers become deprotected and are available for nucleotide coupling.

40. Once the desired features have been activated, a solution containing a single type of deoxynucleotide with a removable protection group is flushed over the wafer's surface. The nucleotide attaches to the activated linkers, initiating the synthesis process.

41. Although each position in the sequence of an oligonucleotide can be occupied by 1of 4nucleotides, resulting in an apparent need for 25 x 4, or 100, different masks per wafer, the synthesis process can be designed to significantly reduce this requirement. It is understood and herein contemplated that algorithms can be used to help minimize mask usage and calculate how to best coordinate probe growth by adjusting synthesis rates of individual probes and identifying situations when the same mask can be used multiple times.

42. Some of the key elements of selection and design are common to the production of all DNA microarrays, regardless of their intended application. Strategies to optimize probe hybridization, for example, are invariably included in the process of probe selection. Hybridization under particular pH, salt, and temperature conditions can be optimized by taking into account melting temperatures and using empirical rules that correlate with desired hybridization behaviors.

43. To obtain a complete picture of a gene's activity, some probes are selected from regions shared by multiple splice or polyadenylation variants. In other cases, unique probes that distinguish between variants are favored. Inter-probe distance is also factored into the selection process. Probes are 3'-biased to match the target generation characteristics of this sample amplification method, but they are also widely spaced to sample various regions of each transcript and provide robustness of detection.

44. A different set of strategies is used to select probes for genotyping arrays that rely on multiple probes to interrogate individual nucleotides in a sequence. The identity of a target base can be deduced using four identical probes that vary only in the target position, each containing one of the four possible bases.

45. Alternatively, the presence of a consensus sequence can be tested using one or two probes representing specific alleles. To genotype heterozygous or genetically mixed samples, arrays with many probes can be created to provide redundant information, resulting in unequivocal genotyping. In addition, generic probes can be used in some applications to maximize flexibility. Some probe arrays, for example,

allow the separation and analysis of individual reaction products from complex mixtures, such as those used in some protocols to identify single nucleotide polymorphisms (SNPs).

46. Immobilized on a plurality of defined regions of the substrate's surface, are localized multiple copies of one or more polynucleotide sequences, preferably copies of a single polynucleotide sequence. A polynucleotide refers to a chain of nucleotides ranging from 5 to 10,000 nucleotides.

47. The plurality of defined regions on the substrate can be arranged in a variety of formats. For example, the regions may be arranged perpendicular or in parallel to the length of the casing. These immobilized copies of a polynucleotide sequence are suitable for use as a target polynucleotide in hybridization experiments. Furthermore, the probes do not have to be directly bound to the substrate, but rather can be bound to the substrate through a linker group. The linker groups may typically vary from about 6 to 50 atoms long. Preferred linker groups include ethylene glycol oligomers, diamines, diacids and the like. Reactive groups on the substrate surface react with one of the terminal portions of the linker to bind the linker to the substrate. The other terminal portion of the linker is then functionalized for binding the polynucleotides.

48. To prepare beads coated with immobilized polynucleotide sequences, beads are immersed in a solution containing the desired polynucleotide sequence and then immobilized on the beads by covalent or noncovalent means. Alternatively, when the polynucleotides are immobilized on rods, a given polynucleotide can be spotted at defined regions of the rod. Typical dispensers include a micropipette delivering solution to the substrate with a robotic system to control the position of the micropipette with respect to the substrate. There can be a multiplicity of dispensers so that reagents can be delivered to the reaction regions simultaneously. In one embodiment, a microarray is formed by using ink-jet technology based on the piezoelectric effect, whereby a narrow tube containing a liquid of interest, such as oligonucleotide synthesis reagents, is encircled by an adapter. An electric charge sent across the adapter causes the adapter to expand at a different rate than the tube and forces a small drop of liquid onto a substrate (Baldeschweiler et al. PCT publication WO95/251116).

49. Samples may be any sample containing polynucleotides (polynucleotide probes) of interest and obtained from any bodily fluid (blood, urine, saliva, phlegm,

gastric juices, etc.), cultured cells, biopsies, or other tissue preparations. DNA or RNA can be isolated from the sample according to any of a number of methods well known to those of skill in the art. For example, methods of purification of nucleic acids are described in Laboratory Techniques in Biochemistry and Molecular Biology: Hybridization With Nucleic Acid Probes. Part I. Theory and Nucleic Acid Preparation, P. Tijssen, ed. Elsevier (1993). In. a preferred embodiment, total RNA is isolated using the TRIzol total RNA isolation reagent (Life Technologies, Inc., Rockville, Md.) and RNA is isolated using oligo d(T) column chromatography or glass beads. After hybridization and processing, the hybridization signals obtained should reflect accurately the amounts of control target polynucleotide added to the sample.

50. Sample polynucleotides may be labeled with one or more labeling moieties to allow for detection of hybridized probe/target polynucleotide complexes. The labeling moieties can include compositions that can be detected by spectroscopic, photochemical, biochemical, bioelectronic, immunochemical, electrical, optical or chemical means. The labeling moieties include radioisotopes, such as .sup.32 P, .sup.33 P or .sup.35 S, chemiluminescent compounds, labeled binding proteins, heavy metal atoms, spectroscopic markers, such as fluorescent markers and dyes, magnetic labels, linked enzymes, mass spectrometry tags, spin labels, electron transfer donors and acceptors, biotin, and the like.

51. Labeling can be carried out during an amplification reaction, such as polymerase chain reaction and in vitro or in vivo transcription reactions. Alternatively, the labeling moiety can be incorporated after hybridization once a probe-target complex his formed. In one preferred embodiment, biotin is first incorporated during an amplification step as described above. After the hybridization reaction, unbound nucleic acids are rinsed away so that the only biotin remaining bound to the substrate is that attached to target polynucleotides that are hybridized to the polynucleotide probes. Then, an avidin-conjugated fluorophore, such as avidin-phycoerythrin, that binds with high affinity to biotin is added.

52. Hybridization causes a polynucleotide probe and a complementary target to form a stable duplex through base pairing. Hybridization methods are well known to those skilled in the art. Stringent conditions for hybridization can be defined by salt concentration, temperature, and other chemicals and conditions. Varying additional parameters, such as hybridization time, the concentration of detergent (sodium dodecyl

sulfate, SDS) or solvent (formamide), and the inclusion or exclusion of carrier DNA, are well known to those skilled in the art. Additional variations on these conditions will be readily apparent to those skilled in the art (Wahl, G. M. and S. L. Berger (1987) Methods Enzymol. 152:399-407; Kimmel, A. R. (1987) Methods Enzymol. 152:507-511; Ausubel, F. M. et al. (1997) Short Protocols in Molecular Biology, John Wiley & Sons, New York, N.Y.; and Sambrook, J. et al. (1989) Molecular Cloning, A Laboratory Manual, Cold Spring Harbor Press, Plainview, N.Y.).

53. Methods for detecting complex formation are well known to those skilled in the art. In a preferred embodiment, the polynucleotide probes are labeled with a fluorescent label and measurement of levels and patterns of complex formation is accomplished by fluorescence microscopy, preferably confocal fluorescence microscopy. An argon ion laser excites the fluorescent label, emissions are directed to a photomultiplier and the amount of emitted light detected and quantitated. The detected signal should be proportional to the amount of probe/target polynucleotide complex at each position of the microarray. The fluorescence microscope can be associated with a computer-driven scanner device to generate a quantitative two-dimensional image of hybridization intensities. The scanned image is examined to determine the abundance/expression level of each hybridized target polynucleotide.

54. In a differential hybridization experiment, polynucleotide probes from two or more different biological samples are labeled with two or more different fluorescent labels with different emission wavelengths. Fluorescent signals are detected separately with different photomultipliers set to detect specific wavelengths. The relative abundances/expression levels of the target polynucleotides in two or more samples is obtained. Typically, microarray fluorescence intensities can be normalized to take into account variations in hybridization intensities when more than one microarray is used under similar test conditions. Individual polynucleotide probe/target complex hybridization intensities can be normalized using the intensities derived from internal normalization controls contained on each microarray.

55. The two cDNA probes are tested by hybridizing them to a DNA microarray. The array holds hundreds or thousands of spots, each of which contains a different DNA sequence. If a probe contains a cDNA whose sequence is complementary to the DNA on a given spot, that cDNA will hybridize to the spot, where it will be detectable by its fluorescence. In this way, every spot on an array is an independent assay for the

presence of a different cDNA. There is enough DNA on each spot that both probes can hybridize to it at once without interference.

2. PNI

56. Psychoneuroendocrinimmune functions refer to the interplay of the endocrine, immune, and neuronal systems to maintain a level of stasis within an individual or subject. PNI gene expression is substantially mediated by the hypothalamus-pituitary-adrenal (HPA) axis. Dysregulation of this axis and thus PNI is associated with a variety of diseases and conditions including inflammatory conditions, cancers, and infectious diseases such as viral and bacterial infections. Because of the diverse nature of the systems involved in PNI function, determining the role PNI plays in a condition and determining the role genes of the various systems play in PNI has been difficult prior to the invention disclosed herein.

57. Herein disclosed are microarrays comprising probes for genes involved in pscyhoneuroendocrinimmune (PNI) activity. Thus, for example, specifically disclosed are microarrays in which the probes are selected to identify the group of genes which can be identified by hybridization to the gene or gene fragments (e.g., ESTs) consisting of SEQ ID NOS: 1-1741 and 3086-3314. These are examples of human gene probes for use in the present microarray. Also disclosed are microarrays in which the genes are selected from the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514. This is a mouse miroarray. It is understood and herein contemplated that microarrays consisting of a subset of the PNI genes disclosed herein can be made. Therefore, specifically disclosed are microarrays of the invention, wherein the array consists of 100 of the human genes selected from the group of PNI associated genes consisting of SEQ ID NO: 1-3514. Also disclosed are microarrays consisting of 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, or 1622 or any number in between of the genes selected from the group of human PNI associated genes consisting of SEQ ID NO: 1-3514. Thus, for example, specifically disclosed is a microarray of the invention, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1-1741 and 3086-3314, and wherein the number of genes selected is 1969. Also disclosed is a microarray of the invention, wherein the genes are selected from the the group of mouse genes consisting of SEQ ID NO: 1742-3085 and 3315-3514, and wherein the number of genes selected is 100. Also disclosed are microarrays consisting of 200, 300, 400, 500, 600, 700, 800, 900, 1000,

1100, 1200, 1300, 1400 or 1542 or any number in between of the genes selected from the group of mouse PNI associated genes consisting of SEQ ID NO: 1-3514.

58. Typically microarrays comprise genes other than those of interest (e.g. PNI associated genes) for purposes of establishing controls for level of gene expression or to monitor the array itself. Such genes are often referred to as housekeeping genes. Control genes can also comprise SEQ ID NOs: 3534-3685. Arabidopsis genes can serve as positive controls for gene expression. Such genes are shown in SEQ ID NO: 3515-3533. It is understood that the specific control genes are not crucial to the microarray and can be exchanged for any equivalent control gene. It is understood that those of skill in the art know which genes can be substituted for the control genes disclosed herein. Thus, specifically disclosed are microarrays of the invention further comprising housekeeping or other control genes. For example, specifically disclosed are microarrays of the invention further comprising genes selected from the group of genes consisting of SEQ ID NOs: 3515-3685.

59. Disclosed are chips where at least one location (address) is the sequences or part of the sequences set forth in any of the nucleic acid sequences disclosed herein. Also disclosed are chips where at least one address is the sequences or portion of sequences set forth in any of the peptide sequences disclosed herein.

60. Also disclosed are chips where at least one address is a variant of the sequences or part of the sequences set forth in any of the nucleic acid sequences disclosed herein. Also disclosed are chips where at least one address is a variant of the sequences or portion of sequences set forth in any of the peptide sequences disclosed herein.

3. Methods of using the microarrays to diagnose a condition

61. The disclosed microarrays have many uses. One such use can relate to diagnosing conditions associated with PNI activity. Therefore, specifically disclosed and herein contemplated are methods for diagnosing a condition associated with PNI activity comprising obtaining a sample from a subject, isolating RNA from the sample, placing the RNA on a PNI microarray, and analyzing the gene expression on the array. Genes and conditions associated with PNI activity have a role in multiple systems in a body and can present a variety of symptoms. It is understood for example that the disclosed methods can be used for conditions, wherein the condition is selected from the group of PNI associated conditions consisting of CFS, type-2 diabetes, allergic

conditions including atopic dermatitis, rheumatic diseases such as rheumatoid arthritis and systemic lupus erythematosus, Sjogren's syndrome, coronary heart disease, inflammatory bowel disease, acute depression, fatigue diseases resulting from defined causes, such as cancer treatment, post traumatic stress disease, susceptibility to alcoholism, Alzheimer's Disease, and cognitive impairment resulting from multiple sclerosis.

62. Also disclosed are diagnositic methods, wherein the condition is an inflammatory condition. It is understood and herein contemplated that inflammatory conditions can also comprise autoimmune diseases as well as allergic reactions. Thus, for example, specifically disclosed are diagnostic methods of the invention, wherein the inflammatory condition is selected from the group of inflammatory conditions consisting of asthma, alopecia areata, systemic lupus erythematosus, rheumatoid arthritis, reactive arthritis, spondylarthritis, systemic vasculitis, insulin dependent diabetes mellitus, multiple sclerosis, experimental allergic encephalomyelitis, Sjögren's syndrome, graft versus host disease, inflammatory bowel disease including Crohn's disease, ulcerative colitis, ischemia reperfusion injury, myocardial infarction, Alzheimer's disease, transplant rejection (allogeneic and xenogeneic), thermal trauma, any immune complex-induced inflammation, glomerulonephritis, myasthenia gravis, cerebral lupus, Guillain-Barre syndrome, vasculitis, systemic sclerosis, anaphlaxis, catheter reactions, atheroma, infertility, thyroiditis, ARDS, post-bypass syndrome, hemodialysis, juvenile rheumatoid, Behcets syndrome, hemolytic anemia, pemphigus, bullous pemphigoid, stroke, atherosclerosis, scleroderma, psoriasis, sarcoidosis, transverse myelitis, acute disseminated encephalomyelitis, post-infectious encephalomyelitis, subacute sclerosing panencephalitis, and chronic inflammatory demyelinating polyradiculopathy.

63. It is understood that the present methods disclosed herein can be used with conditions, wherein the condition is a cancer. Thus, specifically disclosed are methods for diagnosing a condition associated with PNI activity comprising obtaining a tissue sample from a subject, isolating RNA from the sample, placing the RNA on a PNI microarray, and analyzing the gene expression on the array, wherein the cancer is selected from the group of cancers consisting of lymphoma, B cell lymphoma, T cell lymphoma, mycosis fungoides, Hodgkin's Disease, myeloid leukemia, bladder cancer, brain cancer, nervous system cancer, head and neck cancer, squamous cell carcinoma

of head and neck, kidney cancer, lung cancers such as small cell lung cancer and non-small cell lung cancer, neuroblastoma/glioblastoma, ovarian cancer, pancreatic cancer, prostate cancer, skin cancer, liver cancer, melanoma, squamous cell carcinomas of the mouth, throat, larynx, and lung, colon cancer, cervical cancer, cervical carcinoma, breast cancer, and epithelial cancer, renal cancer, genitourinary cancer, pulmonary cancer, esophageal carcinoma, head and neck carcinoma, large bowel cancer, hematopoietic cancers; testicular cancer; colon and rectal cancers, prostatic cancer, or pancreatic cancer.

64. Infectious diseases are conditions associated with a bacterial, viral, fungal, or parasitic infection. Such diseases result in the expression of multiple genes from a variety of systems either through the direct action of the infecting pathogen or as a result of the hosts response to the presence of the pathogen. Thus specifically disclosed are methods for diagnosing a condition associated with PNI activity comprising obtaining a tissue sample from a subject, isolating RNA from the sample, placing the RNA on a PNI microarray, and analyzing the gene expression on the array, wherein the infectious disease is a bacterial infection selected from the group of bacteria consisting of M. tuberculosis, M. bovis, M. bovis strain BCG, BCG substrains, M. avium, M. intracellulare, M. africanum, M. kansasii, M. marinum, M. ulcerans, M. avium subspecies paratuberculosis, Nocardia asteroides, other Nocardia species, Legionella pneumophila, other Legionella species, Salmonella typhi, other Salmonella species, Shigella species, Yersinia pestis, Pasteurella haemolytica, Pasteurella multocida, other Pasteurella species, Actinobacillus pleuropneumoniae, Listeria monocytogenes, Listeria ivanovii, Brucella abortus, other Brucella species, Cowdria ruminantium, Chlamydia pneumoniae, Chlamydia trachomatis, Chlamydia psittaci, Coxiella burnetti, other Rickettsial species, Ehrlichia species, Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes, Streptococcus agalactiae, Bacillus anthracis, Escherichia coli, Vibrio cholerae, Campylobacter species, Neiserria meningitidis, Neiserria gonorrhea, Pseudomonas aeruginosa, other Pseudomonas species, Haemophilus influenzae, Haemophilus ducreyi, other Hemophilus species, Clostridium tetani, other Clostridium species,Yersinia enterolitica, and other Yersinia species.

65. Also disclosed are the diagnostic methods of the invention, wherein the infectious disease is a viral infection selected from the group of viruses consisting of Herpes simplex virus type-1, Herpes simplex virus type-2, Cytomegalovirus, Epstein-

Barr virus, Varicella-zoster virus, Human herpesvirus 6, Human herpesvirus 7, Human herpesvirus 8, Variola virus, Vesicular stomatitis virus, Hepatitis A virus, Hepatitis B virus, Hepatitis C virus, Hepatitis D virus, Hepatitis E virus, Rhinovirus, Coronavirus, Influenza virus A, Influenza virus B, Measles virus, Polyomavirus, Human Papilomavirus, Respiratory syncytial virus, Adenovirus, Coxsackie virus, Dengue virus, Mumps virus, Poliovirus, Rabies virus, Rous sarcoma virus, Yellow fever virus, Ebola virus, Marburg virus, Lassa fever virus, Eastern Equine Encephalitis virus, Japanese Encephalitis virus, St. Louis Encephalitis virus, Murray Valley fever virus, West Nile virus, Rift Valley fever virus, Rotavirus A, Rotavirus B, Rotavirus C, Sindbis virus, Simian Immunodeficiency cirus, Human T-cell Leukemia virus type-1, Hantavirus, Rubella virus, Simian Immunodeficiency virus, Human Immunodeficiency virus type-1, and Human Immunodeficiency virus type-2.

66. Also disclosed are the diagnostic methods of the invention, wherein the infectious disease is a fungal infection selected from the group of fungi consisting of Candida albicans, Cryptococcus neoformans, Histoplama capsulatum, Aspergillus fumigatus, Coccidiodes immitis, Paracoccidiodes brasiliensis, Blastomyces dermitidis, Pneomocystis carnii, Penicillium marneffi, and Alternaria alternata.

67. Also disclosed are the diagnostic methods of the invention, wherein the infectious disease is a parasitic infection selected from the group of parasites consisting of Toxoplasma gondii, Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae, other Plasmodium species, Trypanosoma brucei, Trypanosoma cruzi, Leishmania major, other Leishmania species., Schistosoma mansoni, other Schistosoma species., and Entamoeba histolytica.

68. It is understood that the disclosed microarrays can be used to compile vast databases of the genetic profiles of subjects with a condition associated with PNI activity. Such databases can then be used to establish known genes associated with a particular condition. If using a microarray of the invention, a particular pattern of gene expression of the array itself can be use to identify a pattern associated with a disease state. Such a pattern can be to diagnose a particular condition. Thus also disclosed are diagnostic methods, further comprising making a diagnosis based on the pattern of gene expression on the microarray, wherein a pattern matching one associated with a condition indicates the subject has the condition.

69. The present methods utilize tissue samples as a source of RNA for the microarray samples. As used herein, "tissue sample" refers to any cell, tissue, or organ from a multicellular organism, including but not limited to, blood, neuronal tissue, organ biopsy, lung lavage, sputum, lymph, and excretory waste.

70. The methods disclosed herein often utilize subjects to obtain tissue samples or as a target for diagnosis. It is understood that herein a subject can refer to any mammalian organism including but not limited to mouse, rat, guinea pig, rabbit, dog, cat, pig, horse, cow, monkey, chimpanzee, and human.

4. Computer readable mediums

71. It is understood that the disclosed nucleic acids and proteins can be represented as a sequence consisting of the nucleotides or amino acids. There are a variety of ways to display these sequences, for example the nucleotide guanosine can be represented by G or g. Likewise the amino acid valine can be represented by Val or V. Those of skill in the art understand how to display and express any nucleic acid or protein sequence in any of the variety of ways that exist, each of which is considered herein disclosed. IUPAC symbols provide a convenient, scientifically accepted way to nucleotide or amino acid identification information. Specifically contemplated herein is the display of these sequences on computer readable mediums, such as, commercially available floppy disks, tapes, chips, hard drives, compact disks, and video disks, or other computer readable mediums. Also disclosed are the binary code representations of the disclosed sequences. Those of skill in the art understand what computer readable mediums. Thus, computer readable mediums on which the nucleic acids or protein sequences are recorded, stored, or saved.

72. Disclosed are computer readable mediums comprising the sequences and information regarding the sequences set forth herein. Also disclosed are computer readable mediums comprising the sequences and information regarding the sequences set forth herein.

5. Methods of evaluating expression of genes using microarrays.

73. Disclosed herein are methods relating to the evaluation of gene expression using microarrays. Methods of evaluating expression of genes involved in PNI using microarrays are provided. Disclosed are methods of identifying genes involved in a condition associated with PNI activity comprising obtaining tissue samples from subjects with the condition and a control population, isolating the RNA, analyzing the

RNA using a PNI microarray, and comparing the expression of genes in the subjects with the condition to the control population. In this analysis, a variety of known algorithms can be applied based on, for example, an experimental result in which gene expression present in 70% or more of the subjects with a diagnosed condition, but in fewer than 20% of the controls without the condition indicates genes involved in a condition associated with PNI activity. Additionally, algorithms relevant to a particular condition can be developed based on the data obtained using the present PNI microarray for a particular condition. These can then be applied to data from unknown subjects.

74. Disclosed are methods of classifying a condition as being associated with PNI activity comprising obtaining tissue samples from subjects with the condition and a control population, isolating the RNA, analyzing the RNA using a PNI microarray, and comparing the expression of genes in the subjects with the condition to the control population, wherein conditions that result in gene expression present in 70% or more of the subjects, but in fewer than 20% of the controls indicates a condition associated with PNI activity.

6. Computer implemented methods of diagnosing PNI diseases by gene expression profile comparison.

75. Disclosed are computer implemented methods of receiving patient PNI microarray gene expression data, creating a gene expression profile from said data, comparing patient gene expression profile to known PNI disease gene expression profiles, and diagnosing patient condition based on percent similarity to known PNI disease gene expression profiles. Also disclosed are methods of analyzing microarrays using computer readable mediums. It is understood and herein contemplated that technological advances have enabled researchers to study overall patterns in gene expression. This is significant, as these patterns provide the context for specific observations. For certain complex diseases, distinctive peripheral blood gene expression patterns have been characterized. For example, herein discosed, individuals with chronic fatigue syndrome (CFS) were compared with healthy controls by gene expression profiling, and evidence for altered expression of immune and nervous system genes in the CFS patients was found.

76. Such disease gene expression profiles can be used in conjunction with a computer implemented disease diagnosis system. Known disease gene expression

profiles can be stored in a database. These profiles can be stored in a disease gene expression profile table consisting of a column indicating the unique gene identifier and a column indicating the expression level corresponding to the gene. Disease gene expression data can be stored as a range of expression levels or many profiles for an individual disease can be stored. The gene expression data obtained from a PNI microarray for a patient with a possible PNI disease can be stored in a patient experiment table consisting of a column indicating the unique gene identifier and a column indicating the expression level corresponding to the gene. Patient gene expression data can also be stored as a range of expression levels. The patient experiment table can be computationally compared to the disease gene expression profile table. From this comparison a diagnosis and a percent confidence can be calculated based on the similarity between the patient gene expression profile and the known disease gene expression profile. A graphical user interface can be used to make such diagnosis user friendly.

77. Thus specifically disclosed and herein contemplated are computer implemented methods of comparing gene expression profiles for disease diagnosis, the method comprising a) providing a database including a library of known disease gene expression profiles; b) receiving patient gene expression data from PNI microarray; c) converting said patient gene expression data into a gene expression profile; d) comparing patient gene expression profile to known disease gene expression profile library; e) determining percent confidence of patient disease from patient gene expression profile similarity to known disease gene expression profile library; and f) displaying the results of said determination.

78. Also disclosed are systems for diagnosing a disease comprising a database for storing at least one of a plurality of known disease gene expression profiles and a processor for performing the steps of: a) storing a plurality of known disease gene expression profiles; b) receiving patient gene expression data; c) converting patient gene expression data into a patient gene expression profile; d) performing a comparison operation on the plurality of known disease gene expression profiles and the patient gene expression profile to produce a percent confidence corresponding to a known disease; and e) outputting the disease diagnosis and percent confidence on an output device.

7. Methods of screening using a chip/microarray.

79. Disclosed are methods of screening pharmaceutical agents for the ability to modulate genes involved in PNI. In the screening method, a putative modulator of a disease mechanism involving PNI or the HPA axis is administered to an experimental subject whose gene expression is then measured using the present PNI microarray, followed by comparing the gene expression profile to a profile from a similar subject not receiving the putative modulator. A change in the PNI profile of the subject receiving the putative modulator compound indicates that the compound is a modulator of PNI or the HPA axis. Also disclosed are methods of diagnosing subjects with a condition comprising removing a DNA or RNA source sample from the subject and subjecting the sample to a PNI microarray.

C. Compositions

80. Disclosed are the components to be used to prepare the disclosed compositions as well as the compositions themselves to be used within the methods disclosed herein. These and other materials are disclosed herein, and it is understood that when combinations, subsets, interactions, groups, etc. of these materials are disclosed that while specific reference of each various individual and collective combinations and permutation of these compounds may not be explicitly disclosed, each is specifically contemplated and described herein. For example, if a particular PNI array is disclosed and discussed and a number of modifications that can be made to a number of molecules including the PNI array are discussed, specifically contemplated is each and every combination and permutation of the PNI array and the modifications that are possible unless specifically indicated to the contrary. Thus, if a class of molecules A, B, and C are disclosed as well as a class of molecules D, E, and F and an example of a combination molecule, A-D is disclosed, then even if each is not individually recited each is individually and collectively contemplated meaning combinations, A-E, A-F, B-D, B-E, B-F, C-D, C-E, and C-F are considered disclosed. Likewise, any subset or combination of these is also disclosed. Thus, for example, the sub-group of A-E, B-F, and C-E would be considered disclosed. This concept applies to all aspects of this application including, but not limited to, steps in methods of making and using the disclosed compositions. Thus, if there are a variety of additional steps that can be performed it is understood that each of these additional steps can be

performed with any specific embodiment or combination of embodiments of the disclosed methods.

1. Sequence similarities

81. It is understood that as discussed herein the use of the terms homology and identity mean the same thing as similarity. Thus, for example, if the use of the word homology is used between two non-natural sequences it is understood that this is not necessarily indicating an evolutionary relationship between these two sequences, but rather is looking at the similarity or relatedness between their nucleic acid sequences. Many of the methods for determining homology between two evolutionarily related molecules are routinely applied to any two or more nucleic acids or proteins for the purpose of measuring sequence similarity regardless of whether they are evolutionarily related or not.

82. In general, it is understood that one way to define any known variants and derivatives or those that might arise, of the disclosed genes and proteins herein, is through defining the variants and derivatives in terms of homology to specific known sequences. This identity of particular sequences disclosed herein is also discussed elsewhere herein. In general, variants of genes and proteins herein disclosed typically have at least, about 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, or 99 percent homology to the stated sequence or the native sequence. Those of skill in the art readily understand how to determine the homology of two proteins or nucleic acids, such as genes. For example, the homology can be calculated after aligning the two sequences so that the homology is at its highest level.

83. Another way of calculating homology can be performed by published algorithms. Optimal alignment of sequences for comparison can be conducted by the local homology algorithm of Smith and Waterman Adv. Appl. Math. 2: 482 (1981), by the homology alignment algorithm of Needleman and Wunsch, J. MoL Biol. 48: 443 (1970), by the search for similarity method of Pearson and Lipman, Proc. Natl. Acad. Sci. U.S.A. 85: 2444 (1988), by computerized implementations of these algorithms (GAP, BESTFIT, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Genetics Computer Group, 575 Science Dr., Madison, WI), or by inspection.

84. The same types of homology can be obtained for nucleic acids by for example the algorithms disclosed in Zuker, M. *Science* 244:48-52, 1989, Jaeger et al.

Proc. Natl. Acad. Sci. USA 86:7706-7710, 1989, Jaeger et al. *Methods Enzymol.* 183:281-306, 1989 which are herein incorporated by reference for at least material related to nucleic acid alignment. It is understood that any of the methods typically can be used and that in certain instances the results of these various methods can differ, but the skilled artisan understands if identity is found with at least one of these methods, the sequences would be said to have the stated identity, and be disclosed herein.

85. For example, as used herein, a sequence recited as having a particular percent homology to another sequence refers to sequences that have the recited homology as calculated by any one or more of the calculation methods described above. For example, a first sequence has 80 percent homology, as defined herein, to a second sequence if the first sequence is calculated to have 80 percent homology to the second sequence using the Zuker calculation method even if the first sequence does not have 80 percent homology to the second sequence as calculated by any of the other calculation methods. As another example, a first sequence has 80 percent homology, as defined herein, to a second sequence if the first sequence is calculated to have 80 percent homology to the second sequence using both the Zuker calculation method and the Pearson and Lipman calculation method even if the first sequence does not have 80 percent homology to the second sequence as calculated by the Smith and Waterman calculation method, the Needleman and Wunsch calculation method, the Jaeger calculation methods, or any of the other calculation methods. As yet another example, a first sequence has 80 percent homology, as defined herein, to a second sequence if the first sequence is calculated to have 80 percent homology to the second sequence using each of calculation methods (although, in practice, the different calculation methods will often result in different calculated homology percentages).

2. Hybridization/selective hybridization

86. The term hybridization typically means a sequence driven interaction between at least two nucleic acid molecules, such as a primer or a probe and a gene. Sequence driven interaction means an interaction that occurs between two nucleotides or nucleotide analogs or nucleotide derivatives in a nucleotide specific manner. For example, G interacting with C or A interacting with T are sequence driven interactions. Typically sequence driven interactions occur on the Watson-Crick face or Hoogsteen face of the nucleotide. The hybridization of two nucleic acids is affected by a number of conditions and parameters known to those of skill in the art. For example, the salt

concentrations, pH, and temperature of the reaction all affect whether two nucleic acid molecules will hybridize.

87. Parameters for selective hybridization between two nucleic acid molecules are well known to those of skill in the art. For example, in some embodiments selective hybridization conditions can be defined as stringent hybridization conditions. For example, stringency of hybridization is controlled by both temperature and salt concentration of either or both of the hybridization and washing steps. For example, the conditions of hybridization to achieve selective hybridization can involve hybridization in high ionic strength solution (6X SSC or 6X SSPE) at a temperature that is about 12-25°C below the Tm (the melting temperature at which half of the molecules dissociate from their hybridization partners) followed by washing at a combination of temperature and salt concentration chosen so that the washing temperature is about 5°C to 20°C below the Tm. The temperature and salt conditions are readily determined empirically in preliminary experiments in which samples of reference DNA immobilized on filters are hybridized to a labeled nucleic acid of interest and then washed under conditions of different stringencies. Hybridization temperatures are typically higher for DNA-RNA and RNA-RNA hybridizations. The conditions can be used as described above to achieve stringency, or as is known in the art. (Sambrook et al., Molecular Cloning: A Laboratory Manual, 2nd Ed., Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, 1989; Kunkel et al. Methods Enzymol. 1987:154:367, 1987 which is herein incorporated by reference for material at least related to hybridization of nucleic acids). A preferable stringent hybridization condition for a DNA:DNA hybridization can be at about 68°C (in aqueous solution) in 6X SSC or 6X SSPE followed by washing at 68°C. Stringency of hybridization and washing, if desired, can be reduced accordingly as the degree of complementarity desired is decreased, and further, depending upon the G-C or A-T richness of any area wherein variability is searched for. Likewise, stringency of hybridization and washing, if desired, can be increased accordingly as homology desired is increased, and further, depending upon the G-C or A-T richness of any area wherein high homology is desired, all as known in the art.

88. Another way to define selective hybridization is by looking at the amount (percentage) of one of the nucleic acids bound to the other nucleic acid. For example, in some embodiments selective hybridization conditions would be when at least about,

60, 65, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 percent of the limiting nucleic acid is bound to the non-limiting nucleic acid. Typically, the non-limiting primer is in for example, 10 or 100 or 1000 fold excess. This type of assay can be performed at under conditions where both the limiting and non-limiting primer are for example, 10 fold or 100 fold or 1000 fold below their k_d, or where only one of the nucleic acid molecules is 10 fold or 100 fold or 1000 fold or where one or both nucleic acid molecules are above their k_d.

89. Another way to define selective hybridization is by looking at the percentage of primer that gets enzymatically manipulated under conditions where hybridization is required to promote the desired enzymatic manipulation. For example, in some embodiments selective hybridization conditions would be when at least about, 60, 65, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 percent of the primer is enzymatically manipulated under conditions which promote the enzymatic manipulation, for example if the enzymatic manipulation is DNA extension, then selective hybridization conditions would be when at least about 60, 65, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100 percent of the primer molecules are extended. Preferred conditions also include those suggested by the manufacturer or indicated in the art as being appropriate for the enzyme performing the manipulation.

90. Just as with homology, it is understood that there are a variety of methods herein disclosed for determining the level of hybridization between two nucleic acid molecules. It is understood that these methods and conditions can provide different percentages of hybridization between two nucleic acid molecules, but unless otherwise indicated meeting the parameters of any of the methods would be sufficient. For example if 80% hybridization was required and as long as hybridization occurs within the required parameters in any one of these methods it is considered disclosed herein.

91. It is understood that those of skill in the art understand that if a composition or method meets any one of these criteria for determining hybridization either collectively or singly it is a composition or method that is disclosed herein.

3. Nucleic acids

92. There are a variety of molecules disclosed herein that are nucleic acid based, including for example the nucleic acids that encode, for example PTPN18, as well as

various functional nucleic acids. The disclosed nucleic acids are made up of for example, nucleotides, nucleotide analogs, or nucleotide substitutes. Non-limiting examples of these and other molecules are discussed herein. It is understood that for example, when a vector is expressed in a cell, that the expressed mRNA will typically be made up of A, C, G, and U. Likewise, it is understood that if, for example, an antisense molecule is introduced into a cell or cell environment through for example exogenous delivery, it is advantagous that the antisense molecule be made up of nucleotide analogs that reduce the degradation of the antisense molecule in the cellular environment.

a) Nucleotides and related molecules

93. A nucleotide is a molecule that contains a base moiety, a sugar moiety and a phosphate moiety. Nucleotides can be linked together through their phosphate moieties and sugar moieties creating an internucleoside linkage. The base moiety of a nucleotide can be adenin-9-yl (A), cytosin-1-yl (C), guanin-9-yl (G), uracil-1-yl (U), and thymin-1-yl (T). The sugar moiety of a nucleotide is a ribose or a deoxyribose. The phosphate moiety of a nucleotide is pentavalent phosphate. An non-limiting example of a nucleotide would be 3'-AMP (3'-adenosine monophosphate) or 5'-GMP (5'-guanosine monophosphate).

94. A nucleotide analog is a nucleotide which contains some type of modification to either the base, sugar, or phosphate moieties. Modifications to the base moiety would include natural and synthetic modifications of A, C, G, and T/U as well as different purine or pyrimidine bases, such as uracil-5-yl (.psi.), hypoxanthin-9-yl (I), and 2-aminoadenin-9-yl. A modified base includes but is not limited to 5-methylcytosine (5-me-C), 5-hydroxymethyl cytosine, xanthine, hypoxanthine, 2-aminoadenine, 6-methyl and other alkyl derivatives of adenine and guanine, 2-propyl and other alkyl derivatives of adenine and guanine, 2-thiouracil, 2-thiothymine and

95. 2-thiocytosine, 5-halouracil and cytosine, 5-propynyl uracil and cytosine, 6-azo uracil, cytosine and thymine, 5-uracil (pseudouracil), 4-thiouracil, 8-halo, 8-amino, 8-thiol, 8-thioalkyl, 8-hydroxyl and other 8-substituted adenines and guanines, 5-halo particularly 5-bromo, 5-trifluoromethyl and other 5-substituted uracils and cytosines, 7-methylguanine and 7-methyladenine, 8-azaguanine and 8-azaadenine, 7-deazaguanine and 7-deazaadenine and 3-deazaguanine and 3-deazaadenine. Additional base modifications can be found for example in U.S. Pat. No. 3,687,808,

Englisch et al., Angewandte Chemie, International Edition, 1991, 30, 613, and Sanghvi, Y. S., Chapter 15, Antisense Research and Applications, pages 289-302, Crooke, S. T. and Lebleu, B. ed., CRC Press, 1993. Certain nucleotide analogs, such as 5-substituted pyrimidines, 6-azapyrimidines and N-2, N-6 and O-6 substituted purines, including 2-aminopropyladenine, 5-propynyluracil and 5-propynylcytosine. 5-methylcytosine can increase the stability of duplex formation. Often time base modifications can be combined with for example a sugar modifcation, such as 2'-O-methoxyethyl, to achieve unique properties such as increased duplex stability. There are numerous United States patents such as 4,845,205; 5,130,302; 5,134,066; 5,175,273; 5,367,066; 5,432,272; 5,457,187; 5,459,255; 5,484,908; 5,502,177; 5,525,711; 5,552,540; 5,587,469; 5,594,121, 5,596,091; 5,614,617; and 5,681,941, which detail and describe a range of base modifications. Each of these patents is herein incorporated by reference.

96. Nucleotide analogs can also include modifications of the sugar moiety. Modifications to the sugar moiety would include natural modifications of the ribose and deoxy ribose as well as synthetic modifications. Sugar modifications include but are not limited to the following modifications at the 2' position: OH; F; O-, S-, or N-alkyl; O-, S-, or N-alkenyl; O-, S- or N-alkynyl; or O-alkyl-O-alkyl, wherein the alkyl, alkenyl and alkynyl can be substituted or unsubstituted C_1 to C_{10}, alkyl or C_2 to C_{10} alkenyl and alkynyl. 2' sugar modiifcations also include but are not limited to -$O[(CH_2)_n O]_m CH_3$, $-O(CH_2)_n OCH_3$, $-O(CH_2)_n NH_2$, $-O(CH_2)_n CH_3$, $-O(CH_2)_n -ONH_2$, and $-O(CH_2)_nON[(CH_2)_n CH_3)]_2$, where n and m are from 1 to about 10.

97. Other modifications at the 2' position include but are not limted to: C_1 to C_{10} lower alkyl, substituted lower alkyl, alkaryl, aralkyl, O-alkaryl or O-aralkyl, SH, SCH_3, OCN, Cl, Br, CN, CF_3, OCF_3, $SOCH_3$, $SO_2 CH_3$, ONO_2, NO_2, N_3, NH_2, heterocycloalkyl, heterocycloalkaryl, aminoalkylamino, polyalkylamino, substituted silyl, an RNA cleaving group, a reporter group, an intercalator, a group for improving the pharmacokinetic properties of an oligonucleotide, or a group for improving the pharmacodynamic properties of an oligonucleotide, and other substituents having similar properties. Similar modifications can also be made at other positions on the sugar, particularly the 3' position of the sugar on the 3' terminal nucleotide or in 2'-5' linked oligonucleotides and the 5' position of 5' terminal nucleotide. Modified sugars would also include those that contain modifications at the bridging ring oxygen, such as CH_2 and S. Nucleotide sugar analogs can also have sugar mimetics such as cyclobutyl

moieties in place of the pentofuranosyl sugar. There are numerous United States patents that teach the preparation of such modified sugar structures such as 4,981,957; 5,118,800; 5,319,080; 5,359,044; 5,393,878; 5,446,137; 5,466,786; 5,514,785; 5,519,134; 5,567,811; 5,576,427; 5,591,722; 5,597,909; 5,610,300; 5,627,053; 5,639,873; 5,646,265; 5,658,873; 5,670,633; and 5,700,920, each of which is herein incorporated by reference in its entirety.

98. Nucleotide analogs can also be modified at the phosphate moiety. Modified phosphate moieties include but are not limited to those that can be modified so that the linkage between two nucleotides contains a phosphorothioate, chiral phosphorothioate, phosphorodithioate, phosphotriester, aminoalkylphosphotriester, methyl and other alkyl phosphonates including 3'-alkylene phosphonate and chiral phosphonates, phosphinates, phosphoramidates including 3'-amino phosphoramidate and aminoalkylphosphoramidates, thionophosphoramidates, thionoalkylphosphonates, thionoalkylphosphotriesters, and boranophosphates. It is understood that these phosphate or modified phosphate linkage between two nucleotides can be through a 3'-5' linkage or a 2'-5' linkage, and the linkage can contain inverted polarity such as 3'-5' to 5'-3' or 2'-5' to 5'-2'. Various salts, mixed salts and free acid forms are also included. Numerous United States patents teach how to make and use nucleotides containing modified phosphates and include but are not limited to, 3,687,808; 4,469,863; 4,476,301; 5,023,243; 5,177,196; 5,188,897; 5,264,423; 5,276,019; 5,278,302; 5,286,717; 5,321,131; 5,399,676; 5,405,939; 5,453,496; 5,455,233; 5,466,677; 5,476,925; 5,519,126; 5,536,821; 5,541,306; 5,550,111; 5,563,253; 5,571,799; 5,587,361; and 5,625,050, each of which is herein incorporated by reference.

99. It is understood that nucleotide analogs need only contain a single modification, but can also contain multiple modifications within one of the moieties or between different moieties.

100. Nucleotide substitutes are molecules having similar functional properties to nucleotides, but which do not contain a phosphate moiety, such as peptide nucleic acid (PNA). Nucleotide substitutes are molecules that will recognize nucleic acids in a Watson-Crick or Hoogsteen manner, but which are linked together through a moiety other than a phosphate moiety. Nucleotide substitutes are able to conform to a double helix type structure when interacting with the appropriate target nucleic acid.

101. Nucleotide substitutes are nucleotides or nucleotide analogs that have had the phosphate moiety and/or sugar moieties replaced. Nucleotide substitutes do not contain a standard phosphorus atom. Substitutes for the phosphate can be for example, short chain alkyl or cycloalkyl internucleoside linkages, mixed heteroatom and alkyl or cycloalkyl internucleoside linkages, or one or more short chain heteroatomic or heterocyclic internucleoside linkages. These include those having morpholino linkages (formed in part from the sugar portion of a nucleoside); siloxane backbones; sulfide, sulfoxide and sulfone backbones;formacetyl and thioformacetyl backbones; methylene formacetyl and thioformacetyl backbones; alkene containing backbones; sulfamate backbones; methyleneimino and methylenehydrazino backbones; sulfonate and sulfonamide backbones; amide backbones; and others having mixed N, O, S and CH_2 component parts. Numerous United States patents disclose how to make and use these types of phosphate replacements and include but are not limited to 5,034,506; 5,166,315; 5,185,444; 5,214,134; 5,216,141; 5,235,033; 5,264,562; 5,264,564; 5,405,938; 5,434,257; 5,466,677; 5,470,967; 5,489,677; 5,541,307; 5,561,225; 5,596,086; 5,602,240; 5,610,289; 5,602,240; 5,608,046; 5,610,289; 5,618,704; 5,623,070; 5,663,312; 5,633,360; 5,677,437; and 5,677,439, each of which is herein incorporated by reference.

102. It is also understood in a nucleotide substitute that both the sugar and the phosphate moieties of the nucleotide can be replaced, by for example an amide type linkage (aminoethylglycine) (PNA). United States patents 5,539,082; 5,714,331;and 5,719,262 teach how to make and use PNA molecules, each of which is herein incorporated by reference. (See also Nielsen et al., Science, 1991, 254, 1497-1500).

103. It is also possible to link other types of molecules (conjugates) to nucleotides or nucleotide analogs to enhance for example, cellular uptake. Conjugates can be chemically linked to the nucleotide or nucleotide analogs. Such conjugates include but are not limited to lipid moieties such as a cholesterol moiety (Letsinger et al., Proc. Natl. Acad. Sci. USA, 1989, 86, 6553-6556), cholic acid (Manoharan et al., Bioorg. Med. Chem. Let., 1994, 4, 1053-1060), a thioether, e.g., hexyl-S-tritylthiol (Manoharan et al., Ann. N.Y. Acad. Sci., 1992, 660, 306-309; Manoharan et al., Bioorg. Med. Chem. Let., 1993, 3, 2765-2770), a thiocholesterol (Oberhauser et al., Nucl. Acids Res., 1992, 20, 533-538), an aliphatic chain, e.g., dodecandiol or undecyl residues (Saison-Behmoaras et al., EMBO J., 1991, 10, 1111-1118; Kabanov et al.,

FEBS Lett., 1990, 259, 327-330; Svinarchuk et al., Biochimie, 1993, 75, 49-54), a phospholipid, e.g., di-hexadecyl-rac-glycerol or triethylammonium 1,2-di-O-hexadecyl-rac-glycero-3-H-phosphonate (Manoharan et al., Tetrahedron Lett., 1995, 36, 3651-3654; Shea et al., Nucl. Acids Res., 1990, 18, 3777-3783), a polyamine or a polyethylene glycol chain (Manoharan et al., Nucleosides & Nucleotides, 1995, 14, 969-973), or adamantane acetic acid (Manoharan et al., Tetrahedron Lett., 1995, 36, 3651-3654), a palmityl moiety (Mishra et al., Biochim. Biophys. Acta, 1995, 1264, 229-237), or an octadecylamine or hexylamino-carbonyl-oxycholesterol moiety (Crooke et al., J. Pharmacol. Exp. Ther., 1996, 277, 923-937. Numerous United States patents teach the preparation of such conjugates and include, but are not limited to U.S. Pat. Nos. 4,828,979; 4,948,882; 5,218,105; 5,525,465; 5,541,313; 5,545,730; 5,552,538; 5,578,717, 5,580,731; 5,580,731; 5,591,584; 5,109,124; 5,118,802; 5,138,045; 5,414,077; 5,486,603; 5,512,439; 5,578,718; 5,608,046; 4,587,044; 4,605,735; 4,667,025; 4,762,779; 4,789,737; 4,824,941; 4,835,263; 4,876,335; 4,904,582; 4,958,013; 5,082,830; 5,112,963; 5,214,136; 5,082,830; 5,112,963; 5,214,136; 5,245,022; 5,254,469; 5,258,506; 5,262,536; 5,272,250; 5,292,873; 5,317,098; 5,371,241, 5,391,723; 5,416,203, 5,451,463; 5,510,475; 5,512,667; 5,514,785; 5,565,552; 5,567,810; 5,574,142; 5,585,481; 5,587,371; 5,595,726; 5,597,696; 5,599,923; 5,599,928 and 5,688,941, each of which is herein incorporated by reference.

104. A Watson-Crick interaction is at least one interaction with the Watson-Crick face of a nucleotide, nucleotide analog, or nucleotide substitute. The Watson-Crick face of a nucleotide, nucleotide analog, or nucleotide substitute includes the C2, N1, and C6 positions of a purine based nucleotide, nucleotide analog, or nucleotide substitute and the C2, N3, C4 positions of a pyrimidine based nucleotide, nucleotide analog, or nucleotide substitute.

105. A Hoogsteen interaction is the interaction that takes place on the Hoogsteen face of a nucleotide or nucleotide analog, which is exposed in the major groove of duplex DNA. The Hoogsteen face includes the N7 position and reactive groups (NH2 or O) at the C6 position of purine nucleotides.

b) Sequences

106. One particular sequence set forth in PTPN18 and having Genbank accession number NM_014369 is used herein, as an example, to exemplify the

disclosed compositions and methods. It is understood that the description related to this sequence is applicable to any sequence related to PTPN18 unless specifically indicated otherwise. Those of skill in the art understand how to resolve sequence discrepancies and differences and to adjust the compositions and methods relating to a particular sequence to other related sequences. Primers and/or probes can be designed for any PTPN18 sequence given the information disclosed herein and known in the art.

c) Primers and probes

107. Disclosed are compositions including primers and probes, which are capable of interacting with the PTPN18 gene as disclosed herein. In certain embodiments the primers are used to support DNA amplification reactions. Typically the primers will be capable of being extended in a sequence specific manner. Extension of a primer in a sequence specific manner includes any methods wherein the sequence and/or composition of the nucleic acid molecule to which the primer is hybridized or otherwise associated directs or influences the composition or sequence of the product produced by the extension of the primer. Extension of the primer in a sequence specific manner therefore includes, but is not limited to, PCR, DNA sequencing, DNA extension, DNA polymerization, RNA transcription, or reverse transcription. Techniques and conditions that amplify the primer in a sequence specific manner are preferred. In certain embodiments the primers are used for the DNA amplification reactions, such as PCR or direct sequencing. It is understood that in certain embodiments the primers can also be extended using non-enzymatic techniques, where for example, the nucleotides or oligonucleotides used to extend the primer are modified such that they will chemically react to extend the primer in a sequence specific manner. Typically the disclosed primers hybridize with the PTPN18 gene or region of the PTPN18 gene or they hybridize with the complement of the PTPN18 gene or complement of a region of the PTPN18 gene.

108. The size of the primers or probes for interaction with the PTPN18 gene in certain embodiments can be any size that supports the desired enzymatic manipulation of the primer, such as DNA amplification or the simple hybridization of the probe or primer. A typical PTPN18 primer or probe would be at least 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79,

80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000, 3500, or 4000 nucleotides long.

109. In other embodiments an PTPN18 primer or probe can be less than or equal to 6, 7, 8, 9, 10, 11, 12 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000, 3500, or 4000 nucleotides long.

110. The primers for the PTPN18 gene typically will be used to produce an amplified DNA product that contains a region of the PTPN18 gene. In general, typically the size of the product will be such that the size can be accurately determined to within 3, or 2 or 1 nucleotides.

111. In certain embodiments this product is at least 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000, 3500, or 4000 nucleotides long.

112. In other embodiments the product is less than or equal to 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 125, 150, 175, 200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1250, 1500, 1750, 2000, 2250, 2500, 2750, 3000, 3500, or 4000 nucleotides long.

4. Compositions identified by screening with disclosed compositions / combinatorial chemistry

a) Computer assisted drug design

113. The disclosed compositions can be used as targets for any molecular modeling technique to identify either the structure of the disclosed compositions or to identify potential or actual molecules, such as small molecules, which interact in a desired way with the disclosed compositions. The nucleic acids, peptides, and related molecules disclosed herein can be used as targets in any molecular modeling program or approach.

114. It is understood that when using the disclosed compositions in modeling techniques, molecules, such as macromolecular molecules, will be identified that have particular desired properties such as inhibition or stimulation or the target molecule's function.

115. Thus, one way to isolate molecules that bind a molecule of choice is through rational design. This is achieved through structural information and computer modeling. Computer modeling technology allows visualization of the three-dimensional atomic structure of a selected molecule and the rational design of new compounds that will interact with the molecule. The three-dimensional construct typically depends on data from x-ray crystallographic analyses or NMR imaging of the selected molecule. The molecular dynamics require force field data. The computer graphics systems enable prediction of how a new compound will link to the target molecule and allow experimental manipulation of the structures of the compound and target molecule to perfect binding specificity. Prediction of what the molecule-compound interaction will be when small changes are made in one or both requires molecular mechanics software and computationally intensive computers, usually coupled with user-friendly, menu-driven interfaces between the molecular design program and the user.

116. Examples of molecular modeling systems are the CHARMm and QUANTA programs, Polygen Corporation, Waltham, MA. CHARMm performs the energy minimization and molecular dynamics functions. QUANTA performs the construction, graphic modeling and analysis of molecular structure. QUANTA allows interactive construction, modification, visualization, and analysis of the behavior of molecules with each other.

117. A number of articles review computer modeling of drugs interactive with specific proteins, such as Rotivinen, et al., 1988 *Acta Pharmaceutica Fennica* 97, 159-166; Ripka, *New Scientist* 54-57 (June 16, 1988); McKinaly and Rossmann, 1989 *Annu. Rev. Pharmacol. Toxiciol.* 29, 111-122; Perry and Davies, QSAR: Quantitative Structure-Activity Relationships in Drug Design pp. 189-193 (Alan R. Liss, Inc. 1989); Lewis and Dean, 1989 *Proc. R. Soc. Lond.* 236, 125-140 and 141-162; and, with respect to a model enzyme for nucleic acid components, Askew, et al., 1989 *J. Am. Chem. Soc.* 111, 1082-1090. Other computer programs that screen and graphically depict chemicals are available from companies such as BioDesign, Inc., Pasadena, CA., Allelix, Inc, Mississauga, Ontario, Canada, and Hypercube, Inc., Cambridge, Ontario. Although these are primarily designed for application to drugs specific to particular proteins, they can be adapted to design of molecules specifically interacting with specific regions of DNA or RNA, once that region is identified.

118. Although described above with reference to design and generation of compounds which could alter binding, one could also screen libraries of known compounds, including natural products or synthetic chemicals, and biologically active materials, including proteins, for compounds which alter substrate binding or enzymatic activity.

5. Kits

119. Disclosed herein are kits that are drawn to reagents that can be used in practicing the methods disclosed herein. The kits can include any reagent or combination of reagent discussed herein or that would be understood to be required or beneficial in the practice of the disclosed methods. For example, the kits could include primers to perform the amplification reactions discussed in certain embodiments of the methods, as well as the buffers and enzymes required to use the primers as intended. For example, disclosed is a kit for assessing a subject's risk for CFS, comprising a microarray with probes.

D. Methods of using the compositions

1. Methods of using the compositions as diagnostic and research tools

120. The disclosed compositions can be used in a variety of ways as research tools. For example, the disclosed compositions, can be used to study the interactions between genes associated with neuronal, endocrine, and immune responses.

121. The disclosed compositions can also be used diagnostic tools related to diseases, such as CFS, inflammatory conditions, cancer, infectious diseases including but not limited to viral, bacterial, fungal, and parasitic infections.

122. Throughout this application, various publications are referenced. The disclosures of these publications in their entireties are hereby incorporated by reference into this application in order to more fully describe the state of the art to which this invention pertains. The references disclosed are also individually and specifically incorporated by reference herein for the material contained in them that is discussed in the sentence in which the reference is relied upon.

123. It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the scope or spirit of the invention. Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

E. Examples

124. The following examples are put forth so as to provide those of ordinary skill in the art with a complete disclosure and description of how the compounds, compositions, articles, devices and/or methods claimed herein are made and evaluated, and are intended to be purely exemplary of the invention and are not intended to limit the scope of what the inventors regard as their invention. Efforts have been made to ensure accuracy with respect to numbers (e.g., amounts, temperature, etc.), but some errors and deviations should be accounted for. Unless indicated otherwise, parts are parts by weight, temperature is in °C or is at ambient temperature, and pressure is at or near atmospheric.

1. Example 1

a) Evaluation of a Psychoneuroendocrinimmune (PNI) Microarray as a tool for gene expression profiling of Chronic Fatigue Syndrome and other complex diseases resulting from dysregulation of the Hypothalamic-Pituitary-Adrenal axis

125. Due to the complexity of interactions between immune, endocrine, and nervous systems, assays for one or a few biomolecular markers can be uninformative or

misleading. Accordingly, diseases which are characterized by disturbances in one or more of these systems, and the interactions between them, are among the most significant research and clinical challenges. An oligonucleotide microarray composed entirely of PNI genes (the PNI array) was designed, which can allow a researcher to assess the overall psychoneuroendocrineimmune state of an individual, and to observe systemic responses to various stressors. The PNI array has widespread applicability and marketability in the diagnosis and treatment of diseases that result from dysregualtion of the HPA axis. A total of 1451 genes encoding 1738 transcriptional products are represented on the PNI array, and gene choices were guided by the goal of elucidating biological pathways. Splice variants of the PNI genes can be distinguished, and samples from human or mouse can hybridize with equal affinity, facilitating animal studies. Described here is a series of discrete projects designed to validate results obtained using the PNI array, and demonstrate its utility for research of Chronic Fatigue Syndrome and other diseases involving PNI.

126. Microarray technology allows discovery of gene expression patterns, which can be more meaningful than observations about fluctuations in expression levels of individual genes. Peripheral blood has been shown to contain distinctive gene expression patterns in several diseases which cannot easily be studied. Vernon, et al. compared individuals with Chronic Fatigue Syndrome to healthy controls using gene expression profiling, and found evidence for nervous and immune system dysfunction in the CFS patients (Vernon, et al., 2002, which is hereby incorporated by reference in its entirety for it's teaching of use of a microarray to determine the expression profiles of patients with CFS and the expression profiles for CFS patients). Like many other diseases, CFS is caused or maintained by psychoneuroendocrineimmune (PNI) dysregulation, possibly due to HPA axis malfunction (Figure 1). Some of these other well-studied diseases are manifestly physical, including type-2 diabetes (Rosmond, 2003), allergic conditions including atopic dermatitis (Buske-Kirschbaum, et al., 2002), rheumatic diseases such as rheumatoid arthritis and systemic lupus erythematosus (Crofford, 2002; Wilder, 2002), coronary heart disease (Yudkin, et al., 2000), and inflammatory bowel disease (Straub, et al., 2002). Others, such as acute depression (Parker, et al., 2003), fatigue diseases resulting from defined causes, such as cancer treatment (Morrow, et al., 2002), or as yet undefined causes, including chronic fatigue syndrome (CFS) (Parker, et al., 2001; Racciatti, et al., 2001), post traumatic stress

disease (Yehuda, 2001), susceptibility to alcoholism (Hernandez-Avila, et al., 2002), Alzheimer's Disease (Peskind, et al., 2001), and cognitive impairment resulting from multiple sclerosis (Heesen, et al., 2002; Then Bergh, et al., 1999), have a neurological component and result in a reduced sense of well-being.

127. Unfortunately, the microarray community is increasingly realizing that with recent advances in technology, the bottleneck has shifted from data production to data analysis. Sifting through the immense quantity of data produced by whole-genome arrays is a daunting task, particularly for researchers who are truly interested only in a subset of genes, representing one or a few functional systems.

128. In order to remedy this oversight, a novel oligonucleotide microarray was designed and produced for detection of changes in the signals being sent between the brain and nervous system and the immune and endocrine systems. A list of genes was compiled encoding proteins that participate in modulation of immune, neuroendocrine, endocrine, or nervous system functions. Particular emphasis was placed on identifying genes acting in the HPA axis.

129. Oligos were selected from the coding sequence of the PNI genes. In addition to the standard considerations for oligo selection, two additional criteria were applied. Firstly, oligos were chosen that will allow very precise determination of relative abundance of each transcriptional variant. This can be important, as transcriptional variants can possess differing, even self-negating, functions. For example, the ZER6 transcription factor has two isoforms, only one of which interacts with estrogen-receptor alpha, and the relative level of expression of these two isoforms regulates transcription by hormone-responsive cells (Conroy, et al., 2002). Alterations in ratios between transcriptional variants can be characteristic of disease state, as is the case with certain transcripts of BDNF (Brain Derived Neurotropic Factor) in Alzheimer's disease patients (Garzon, et al., 2002). Transcriptional variants of the FGF-inducible mi-er1 gene differ in their subcellular localization (Paterno, et al., 2002), and several proteins are produced in both soluble and membrane-bound isoforms (Kapur, et al., 2002; Tenhunen & Ulmanen, 1993). Secondly, the selected oligos match nucleotide sequences that are either identical in both human and mouse gene homologs, or contain only a few mismatches on the 5′ end. Consequently, the PNI array can be useful for researchers using mouse as a model system for human disease, and results from human and mouse studies using the PNI array are directly comparable.

130. Each gene was annotated in a customized Microsoft Access database to include functional information, alternate gene names, and protein, mRNA, and coding sequences. 1451 non-redundant genes were included, several of which encoded multiple transcriptional products representing functional regulation at the RNA level. The entries were standardized to the NCBI RefSeq project, to facilitate future analyses. Figure 2 shows the composition of this array.

131. Nimblegen has two design formats available, 196K and 85K. Ten slides were received from Nimblegen in the 196K format. The standard hybridization protocol was found to produce a good dynamic range of signal intensity on these slides, with minimal background (Figure 3a). However, it was clear that the extremely small size of these spots complicated data extraction. A sample 85K data file received from Nimblegen revealed that the 85K format allows reliable data retrieval (Figure 3b).

132. While the uses for a microarray of this design in basic research are immediately apparent, the real interest is in its utility for clinical application. Because the peripheral blood is a rich source of immune cells, and a readily available tissue sample, the utility of a PNI microarray in analysis of blood samples was evaluated.

133. This sort of analysis is unfortunately confounded by the fact that most neurotransmitters and hormones are produced, and act, at sites distinct from the peripheral blood. Additionally, the microenvironment of the brain is protected by the blood-brain barrier, a lipid membrane that under normal conditions excludes cells, both bacterial and immune, as well as most large molecules (Paulson, 2002). There are several mechanisms by which dysregulation of PNI interactions can be reflected in peripheral blood gene expression patterns. One is changes in cytokine production would be detected, as would changes in expression levels of genes that are regulated by circulating hormones, neurotransmitters, and growth factors. Another is inappropriate neuroendocrine gene expression in circulating immune cells. Inflammatory cytokine release, excessive stress, or other as yet unidentified PNI disturbance may increase permeability of the blood-brain barrier to leukocyte infiltration, exposing these cells to the microenvironment of the brain and changing their gene expression patterns. Lastly, peripheral blood can play a more active role in producing appropriate PNI response than has previously been suspected.

134. In order to bioinformatically simulate microarray analsyis of PNI genes in peripheral blood, an Expressed Sequence Tag (EST) database was compiled from

NCBI's dbEST using nine EST libraries prepared using normal human blood samples. Libraries prepared from tumor cell lines or leukemia samples were excluded from the analysis due to concerns that pathological alterations in gene expression of these cells would be a confounding factor. The ESTs were formatted into a blastable database of approximately 30,000 sequences. Of the 1451 genes, 505 were detectable in the blood EST database. The majority were previously characterized as expressed in blood, with some interesting exceptions. The preferential expression of immune system genes in peripheral blood cells (52% of the detected genes were in the immune system category, as compared to 40% of all PNI genes examined) was expected, but evidence of peripheral blood expression of many genes involved in endocrine and neuronal processes was exciting and informative.

135. Recently, isolated PBMCs were shown to undergo higher rates of apoptosis than whole blood, as measured by Annexin V binding. Additional studies showed considerable change in gene expression subsequent to collection by standard methods, as compared to the PAXgene whole blood collection system supplied by Qiagen (figure 4). It is certainly possible that previous studies of chronic fatigue syndrome that relied on data collected from isolated PBMCs were confounded by this phenomenon, and the present PNI array is well suited for investigating this possibility.

136. PBMCs can be obtained from whole blood collected in the presence of EDTA. Whole blood can be collected in parallel using the Qiagen PAXgene blood RNA system. RNA can be extracted from each sample using Trizol, and quantified by a RiboGreen assay. RNA samples can be reverse-transcribed in the presence of biotin-11-UTP, then hybridized to the oligonucleotides on glass array slides using the Ventana Automated Hybridization instrument. The biotinylated sample hybridized to the oligonucleotides can be detected at 600nm using RLS-gold particles. Signal intensity data can be collected with Arrayvision software.

137. Next, the possibility that isolation of PBMCs changes the gene expression profiles of the cells is addressed by comparing RNA extracted from whole blood by the two different collection methods, both to each other and to results of analysis of PBMCs. Based on these results a preferred method of blood handling can be selected. From three individuals, three alliquots of blood can be collected. One alliquot can be collected using the Qiagen PAXgene system, and the second and third aliquots can be collected using standard methods. One of these can be processed to

isolate PBMCs. RNA is extracted as soon as possible after blood is collected from the first individual, and after delays of four and twenty-four hours after blood is collected from the second and third individuals, respectively.

138. Finally, results obtained from the PNI array can be directly compared to results from MWG 30K arrays (MWG Biotech Inc.'s 30K array). Blood samples are collected from two individuals using the selected method, and divided into two aliquots. One aliquot from each sample can be hybridized to each of the two arrays. The subset of oligos on the MWG 30K array that correspond to one of the genes on the PNI array can be selected for comparison.

139. Monozygotic (MZ) twins are presumed to share 100% of their genes and to have been raised in similar environments (with the exception of twins separated at birth). As a result, twin studies are a classic method for examining heritability of incompletely penetrant genetic traits. Comparisons of gene expression profiles of monozygotic twins can be particularly informative, as the heritable individual variability in expression of a wide range of genes that confounds many microarray studies would be quantifiable within this population. As a result, consistent differences in gene expression profiles of MZ twins disconcordant for CFS are more readily distinguished.

2. Example 2

140. PNI gene expression is substantially mediated by the hypothalamus-pituitary-adrenal (HPA) axis. It would therefore be of great value to be able to characterize changes in peripheral blood gene expression patterns that are reflective of HPA axis dysregulation. The HPA axis is a homeostatic feedback loop, in which the hypothalamus secretes corticotropin releasing factor (CRF), which stimulates the pituitary to secrete adrenocorticotropic hormone (ACTH), which in turn directs the adrenals to secrete corticosteroids, providing negative feedback to the hypothalamus and pituitary (Figure 1). Each component of the HPA axis is regulated by a variety of external and internal stimuli, some of which are listed in Table 1 and Figure 6.

Table 1: A variety of factors up-regulate (+) or down-regulate (-) hypothalamus-pituitary-adrenal (HPA) axis activity

HPA axis component	Regulating factors
Hypothalamus (PVN or paraventricular nucleus)	Cytokines and Growth Factors (+/-) Neural Inputs (+/-) Sex Hormones (+/-) Prostaglandins (+) Leptin (+/-) Neuropeptides (+/-)
Pituatary (corticotrope)	Cytokines and Growth Factors (+/-) Vasopressin (-) Prostaglandins (-) Opiates (-) Catecholamines (+)
Adrenal (fdrenal fasiculata)	Cytokines and Growth Factors (+/-) Prostaglandins (+) Sex Hormones (+/-) Neural Input (+/-)

141. HPA axis dysfunction has been implicated in a variety of complex diseases. Some of these are manifestly physical, including type -2 diabetes (Rosmond, 2003); allergic conditions including atopic dermatitis (Buske-Kirschbaum, et al., 2002); rheumatic diseases such as rheumatoid arthritis and systemic lupus erythematosus (Crofford, 2002; Wilder, 2002); Sjogren's syndrome (Johnson, et al., 2000); coronary heart disease (Yudkin, et al., 2000); and inflammatory bowel disease (Straub, et al., 2002). Others, such as acute depression (Parker, et al., 2003); fatigue diseases resulting from defined causes, such as cancer treatment (Morrow, et al., 2002), or as yet undefined causes, including chronic fatigue syndrome (CFS) (Parker, et al., 2001; Racciatti, et al., 2001); post-traumatic stress disorder (Yehuda, 2001); susceptibility to alcoholism (Hernandez-Avila, et al., 2002); Alzheimer's Disease (Peskind, et al., 2001); and cognitive impairment resulting from multiple sclerosis (Heesen, et al., 2002; Then Bergh, et al., 1999), have a neurological component and result in a reduced sense of well-being.

142. The protection of the blood-brain barrier is not absolute and can be breached when the PNI interactions are disrupted. Acute stress increases permeability of the blood-brain barrier due to release of CRF (Esposito, et al., 2003; Esposito, et al., 2002; Esposito, et al., 2001). Likewise, the limited ability of leukocytes and certain bacteria and viruses to penetrate between the endothelial cells into the brain is greatly enhanced by increased endothelial production of inter-cellular adhesion molecule-1

(ICAM-1) (Dietrich, 2002). Because ICAM-1 expression is up-regulated by cytokines such as Tumor Necrosis Factor-α (Wong & Dorovini-Zis, 1992) and down-regulated by glucocorticoid hormones (Liden, et al., 2000) and interferon-β (Floris, et al., 2002), immunological disturbances can alter the permeability of the blood-brain barrier. This is not merely a theoretical possibility: compelling evidence has linked this increased permeability to central nervous system disorders such as multiple sclerosis (Greenwood, et al., 2002). Even when the blood-brain barrier remains intact, the brain can be affected by changes in expression of PNI genes. As an example, increased serum levels of insulin-like growth factor-1 promote the clearance of amyloid-β from the cortex and hypothalamus (Carro, et al., 2002).

143. Thus, there are several mechanisms by which dysregulation of PNI interactions could be reflected in peripheral blood gene expression patterns. The most likely to be detected are changes in cytokine production and changes in expression levels of genes that are regulated by circulating hormones, neurotransmitters, and growth factors. Inappropriate neuroendocrine gene expression in circulating immune cells would be detected, but is unlikely. Also possible is a more active role than has previously been suspected for peripheral blood in producing an appropriate PNI response. Lastly, inflammatory cytokine release, excessive stress, or other as yet unidentified PNI disturbances that increase permeability of the blood-brain barrier to leukocyte infiltration, exposing them to the microenvironment of the brain and producing gene expression alterations that can remain detectable upon re-entry to the blood stream.

144. Technological advances have enabled researchers to study overall patterns in gene expression. This is significant, as these patterns provide the context for specific observations. For certain complex diseases, distinctive peripheral blood gene expression patterns have been characterized. In one example, individuals with chronic fatigue syndrome (CFS) were compared with healthy controls by gene expression profiling, and evidence for altered expression of immune and nervous system genes in the CFS patients was found (Vernon, et al., 2002).

a) Methods & Materials

145. A list of genes encoding proteins that participate in modulation of immune, neuroendocrine, endocrine, or nervous system functions was compiled.

Particular emphasis was placed on functions mediated by the HPA axis. Each gene was annotated in a customized Microsoft Access database to include functional information, alternate gene names, and both protein and mRNA sequences. One thousand four hundred fifty one non-redundant genes were included, several of which encoded multiple transcriptional products representing functional regulation at the RNA level. The entries were standardized to the National Center for Biotechnology Information (NCBI) RefSeq project, to facilitate future analyses.

146. To determine expression of these candidate genes in circulating blood, an expressed sequence tag (EST) database was compiled from NCBI's GenBand EST database (dbEST) using nine EST libraries prepared using normal human blood samples. Libraries prepared from tumor cell lines or leukemia samples were excluded because the pathological alterations in gene expression of these cells were considered likely to confound the analysis. The ESTs were formatted into a blastable database of approximately 30,000 sequences, each of which could be directly traced to its original dbEST entry and was by definition representative of gene expression detectable in blood samples.

147. The 1451 PNI genes represent hormones, neurotransmitters, and cytokines, which are the principal signaling molecules of the endocrine, neuronal, and immune systems respectively, and a variety of genes whose expression or activities are regulated by these signals. Table 2 categorizes the PNI genes according to predominant system and subcategorizes them by function. The largest group of genes selected, representing slightly more than 40%, were the immune system genes, followed by endocrine (24%) and neuronal (14%) genes (Figure 5A). The remaining genes either have well characterized roles in multiple systems, or were of interest primarily due to their functional or regulatory characteristics, and thus were designated as "other". Of the 1451 genes, 505 were detectable in the blood EST database (Figure 5B).

148. Most of PNI genes identified in the database were previously characterized as expressed in blood, with some interesting exceptions. The preferential expression of immune system genes in peripheral blood cells (52% of the detected genes were in the immune system category, compared to 40% of all PNI genes examined) was expected, but peripheral blood expression of many genes involved in endocrine and neuronal processes was quite intriguing.

Table 2: Details of the categorical distribution of PNI genes.

Category	PNI genes	Found In Blood	(%)
Endocrine System			
Hormone Metabolism	79	17	(22)
Hormone Receptor	95	12	(13)
Hormones	45	1	(2)
Regulated by Hormones	28	11	(39)
Regulates Hormone Activity	53	25	(47)
Regulates Hormone Expression	18	6	(33)
Other Neuroendocrine Function	30	12	(40)
Nervous System			
Neurotransmitter	20	0	(0)
Neurotransmitter Metabolism	32	10	(31)
Neurotransmitter Receptor	100	3	(3)
Regulated by Neurotransmitters	2	1	(50)
Regulates Neurotransmitter Activity	51	10	(20)
Regulates Neurotransmitter Expression	1	0	(0)
Immune System			
Apoptosis	40	26	(65)
Complement Component	29	7	(24)
Cytokine or Chemokine Receptors	90	38	(42)
Cytokines and Chemokines	108	31	(29)
MHC/HLA	18	17	(94)
Regulated by Cytokines or chemokines	9	4	(44)
Regulates Cytokine Activity	20	7	(35)
T-cell Activation	6	3	(50)
Other Immune Function	261	134	(51)
Signal Transduction	55	31	(56)
Protease Inhibitor	9	4	(44)
Transcription Factor	92	44	(48)
Circadian	7	4	(57)
Regulation of Cell Growth	40	6	(15)
Growth Factor	26	5	(19)
Growth Factor Receptor	11	1	(9)
Heat shock	20	11	(55)
Stress Response	10	9	(90)
Homeostasis & Small Molecule transport	32	5	(16)
Other	10	7	(70)
Unknown Function	4	3	(75)
Total (Non-redundant)	1451	505	(35%)

b) Results & Conclusion

149. Bioinformatic evidence suggests that circulating blood cells can respond to hormones and neurotransmitters. As would be expected, there is no evidence for production of hormones or neurotransmitters in the peripheral blood, with the interesting exception of the putative hormone ADM. This hypotensive peptide, which can have neurotransmitter activity, is known to be present in both blood and the central nervous system (Serrano, et al., 2002). However, there was evidence for expression of both neurotransmitter and hormone receptors.

150. Table 3, which is provided herein on compact disc and is incorporated herein in its entirety, shows the gene names, accession numbers, and the human and corresponding mouse sequences for each of the genes on the PNI array. Table 3, created on June 4, 2004 containing 4,608 KB of information, is provided conforming to ISO 9660 standards as a MS Windows XP compatible MS EXCEL XP ASCII file on each of 3 discs.

151. EST sequences representing both the $GABA_{(B)}$ receptor and GABARAP (γ-aminobutyric acid type A receptor-associated protein) were identified, implying the existence of a systemic (GABA)ergic response. Participation of the (GABA)ergic system in immunomodulation has long been recognized (Devoino, et al., 1992), and the role of $GABA_{(A)}$ receptors in stimulating release of hypothalamic and pituitary hormones in response to cytokine activity has been well described (McCann, et al., 2000). A more direct role was indicated by the discovery of a functional $GABA_{(A)}$ receptor on the surface of T cells (Tian, et al., 1999). It is the $GABA_{B(1e)}$ splice variant, which is secreted and competes with $GABA_{B(1a)}$ for dimerization with $GABA_{B(2)}$ (Schwarz, et al., 2000), that is described in peripheral blood and which is perhaps secreted by immune cells to directly regulate the (GABA)ergic system. Peripheral blood expression of the ADRB2 protein, a norepinephine receptor that has a well-documented role in regulating immunity (Sanders & Straub, 2002), and the acetylcholine receptor CHRNB1, which was previously identified as expressed on T and B cells (Hiemke, et al., 1996; Toyabe, et al., 1997) was confirmed.

152. Of the hormone receptors found in peripheral blood, the surprising presence of membrane-associated progesterone receptor PGRMC1 is particularly interesting. The rat homolog has been shown by differential display PCR to be expressed in the hypothalamus and to regulate female reproductive behavior (Krebs, et

al., 2000). The presence in peripheral blood of a hormone receptor that is also expressed in brain and has a known behavioral function is unexpected.

153. Other proteins were of interest due to their capacity to be induced by hormonal activity. One of these was ZNF147, also known as Efp (estrogen-responsive finger protein), which is up-regulated by estrogen and down-regulated by transforming growth factor-β (Inoue, et al., 1993; Inoue, et al., 1999). ZNF147 acts by targeting the 14-3-3sigma protein for proteolysis (Urano, et al., 2002). Since 14-3-3sigma sequesters Bax (Samuel, et al., 2001), which plays an essential role in T-cell development (Bouillet & Strasser, 2002), the presence of this protein in peripheral blood can represent a direct mechanism for endocrine influence on immune function.

154. Examining peripheral blood samples for gene expression patterns representative of PNI dysfunction presents certain challenges, but this analysis shows here how informative it can be. By using peripheral blood to "profile the brain" and characterize the PNI response, insights can be gained about many complex diseases in which there is thought to be PNI dysregulation. This approach can be especially important for diseases for which there is no known lesion, or when known lesions cannot be sampled. Furthermore, this survey of peripheral blood gene expression in relation to PNI function provides evidence to interactions between the endocrine, immune, and nervous systems which had not been previously expected.

3. Example 3

155. Chronic fatigue syndrome appears to be either caused or sustained by dysregulation of the neuroendocrine and/or immune systems. CFS has been shown to be refractory to the established methods of treating circadian disorders, including melatonin thearpy.

156. Historically, assessment of immune and neuroendocrine status has been performed by measuring the levels of relevant proteins or hormones in circulating blood or other bodily fluids. This approach has been productive for studies which focus on a limited number of molecules, but it is less useful for analysis of systemic changes involving multiple signaling pathways. An experimental approach that is much more amenable to analysis of systemic changes is gene expression profiling. The limitation to gene expression profiling of neuroendocrine genes is that the available sample, blood, is not the normal site of expression for many of these genes. However, these results indicate that despite this limitation, assessing the immune and

neuroendocrine irregularities of CFS patients by gene expression profiling of blood samples can be very informative. Herein is described the production of oligonucleotide microarrays, designed to measure expression of genes which encode proteins involved in neuroendocrine/immune interactions, and intended to provide specific information about the expression of known and novel genes in blood.

4. Example 4

a) Background

157. The first iteration of the PNI array is derived from a PNI gene list of 1622 genes. 1435 of the genes encode a single known transcriptional variant, while the remainder encode multiple splice variants, so a total of 1958 transcriptional products are represented. For the majority of the transcriptional products, both human and mouse sequences were either retrieved from the public databases (i.e. Genbank), or could be deduced from publicly available genomic sequences.

b) Probe Selection

158. This first iteration of the PNI array is composed entirely of genes which encode at least one 24-mer that is common to both human and mouse homologs of the gene, with the exception of Arabidopsis controls. In addition, probes were screened to eliminate long (>4) runs of any single nucleotide, or extremes of melting temperature. (Depending on which equation is used, probes fall in a Tm range of approx 50-85°F, or 60-95°F. This is a much greater temperature range than is ultimately desirable for microarray analysis, but a reasonable range for selecting probes to be tested empirically).

159. Of the 1435 PNI genes encoding a single splice variant, 1027 contained at least one 24-mer meeting the above described criteria. These are designated as NoSplice probes. An additional 18 housekeeping genes with a single known splice variant yielded probes meeting the criteria, and probes representing these genes were designated Housekeeping probes. Mismatched probes can be made to the probes from two of these genes (1, 2, 3, and 4 mismatches) for use as a stringency control. A second type of control probe, designed to hybridize to one of ten Arabidopsis genes (for which mRNA is commercially available), was included. Fifty 24-mers meeting the above criteria were selected at random for each gene. Probes encoding the Arabidopsis gene LTP4 can be biotinylated, serving as a positive control for the signal detection process.

160. Microarray technology has proven particularly useful for transcriptional analysis, and can be much more sensitive in detecting alterations in transcriptional abundance than traditional methods. Variants containing unique exons can be detected by probes specific to those exons. Variants lacking unique exons can be detected by two methods: probes complementary to unique splice junctions, and by comparison of the signal intensity of probes which detect exons shared with other variants, in conjunction with information about the expression of those variants. Conditions for these probes have been optimized (Optimization of oligonucleotide arrays and RNA amplification protocols for analysis of transcript structure and alternative splicing; Genome Biology 2003, 4:R66). Huge strides forward have been made in collecting and annotating splice variant information for human (Kan Z, et al. (2001) Genome Res 11, 889-900, Thanaraj, T. (1999) Nucleic Acids Res 27, 2627-37, Christopher Lee, et al (2003) Nucleic Acids Research 31, 101-105) and mouse (Kochiwa H, et al. (2002) Genome Res 12, 1286-93) genomes.

161. Algorithms exist for detection of novel transcriptional variants (Hu GK, et al. (2001) Genome Res 11, 1237-45, hereby incorporated by reference in it's entirety for the disclosure of algorithms) and for validation of predicted variants (D. D. Shoemaker, et al. (2001) Nature 409, 922 - 927, hereby incorporated by reference in it's entirety for the disclosure of algorithms). However, often a biologist in the process of designing a custom microarray is confronted with the situation where many or all of the transcriptional variants of the genes of interest are known, and probes capable of differentiating these variants are desired. Typically, the known variants would be entered into a multiple alignment program, and candidate probes selected based on the results of this alignment. However, this process of manual probe selection is labor intensive, and rather tedious to repeat the hundreds or thousands of times that would be necessary for custom microarray development.

162. The SpliceVariants macro takes an iterative approach to probe selection. For each gene in sequence, it detects the gene abbreviation then counts the number of variants, collecting the variant's unique abbreviation in the process into a multi-dimensional array. Once it reaches the end of the file, or encounters a gene abbreviation for a different gene, it returns to the first variant and counts the number of nucleotides. It then begins the process of probe selection. The researcher specifies the length of the oligo desired, and every possible n-mer of that length is analyzed.

163. For each n-mer in the gene, the program first determines how many variants contain that n-mer. The n-mer is placed into an array of probes that are unique, shared, or common to all variants, as appropriate, and its positions noted. The program then moves over one nucleotide, and repeats the process, iteratively, until the number of variants containing a given n-mer differs from the first in the series. This occurs at an alternatively spliced exon boundary. It is entirely possible that several exons can be shared consecutively by a group of variants, but the position of these exon boundaries is unimportant for the task at hand, so only exon boundaries where alternative splicing occurs are considered. In the interest of brevity, the word "exon" shall be used to refer also to groups of exons which are consecutive in this manner.

164. Once a junction between alternately spliced exons is detected, a set of candidate junction probes is generated for each appropriate variant. The length of the exon is saved along with the sequence of the first n-mer from that exon. This process repeats until the end of the first variant is reached.

165. The second, and subsequent, variants can contain one or more exons in common with previous variants. The computational time required is significantly reduced by comparing the first n-mer of each new exon encountered with the first n-mer of all previous exons. If they are identical, it is assumed that the remaining n-mers for the exon are similarly identical, and the program skips ahead to the beginning of the next exon.

166. After all variants for a given gene have been considered, the program goes to the beginning of the page and outputs the sequences of the unique, common, shared, and junction probes which have been detected. For each probe, a non-redundant probe name is generated which contains information regarding the type of probe (ie unique or common) and the variant or variants in which it occurs. If there is another gene to be analyzed, it repeats.

167. By approaching this challenge as a word-proccessing problem, a de facto multiple alignment of transcriptional variants was accomplished without actually requiring the use of a multiple alignment algorithm. The resulting lists of candidate probes corresponding to unique, shared, or common exons can be used for production of any custom microarray that distinguishes transcriptional variants.

168. The remaining PNI genes are represented by multiple transcriptional variants. A number of these genes were entered into the algorithm written for selection

of probes distinguishing transcriptional variants, but the majority were not due to time constraints. This algorithm yielded probes which were either Common to all variants (designated probe types are indicated by capitalization), Unique to a single variant, Shared between several but not all variants, or present at a splice Junction and capable of distinguishing variants with differing junctions. All PNI genes with multiple splice variants were independently entered into the algorithm written for selection of probes identical in both human and mouse homologs, and redundancies in this list were eliminated. The lists of probes were compared, and probes appearing on both lists were selected for further analysis. Probes derived from sequences of multi-variant genes which have not yet been entered into the SpliceVariants algorithm are designated as MultiVar probes.

169. Many of the genes are represented by large numbers of probes. In those cases where there were fewer than 100 probes meeting the above criteria, all eligible probes were selected for subsequent analysis. In cases where greater than 100 probes met the criteria, 50 were chosen at random for subsequent analysis.

170. The resulting series of 42489 probes was checked for predicted secondary structures, and uniqueness within the human genome. Balancing the results of these evaluations with the need to retain at least one probe for each of the genes of interest (although nine housekeeping genes were eliminated as no high-quality probes could be generated from their sequences), a final list of 12450 probes was generated. The distribution of probe types is given in Table 4, and the names of the genes/gene variants and number of probes generated from each sequence is shown in Table 5. A total of 1132 PNI genes are represented in this first iteration of the PNI array, along with 19 genes included as housekeeping or Arabidopsis controls.

Table 4

Probe Type	Number of probes
Arabidopsis	132
Arabidopsis-Biotinylated	16
Common	286
Housekeeping	159
Housekeeping Mismatch	60
Junction	9
MultiVar	1294
NoSplice	10355
Shared	20
Unique	119
Total	12450

c) Second iteration PNI array

171. As the understanding of immune, neurological, and endocrine processes increases, important roles for a larger number of specific proteins in these processes are being learned. Thus, the second iteration of the PNI array can be generated from a larger initial gene list. The second iteration of the PNI array can be generated from an initial gene list containing 2000-3000 genes, representing 5000-6000 transcriptional products.

172. PNI genes which encode no 24-mers that are perfectly conserved between human and mouse sequences are still important, and the second iteration of the PNI array can contain 24-mers from regions substantially different between the human and mouse homologs (one for human, one for mouse) so that the array can be a tool useful for animal model studies as well as human clinical studies. These probes lack the advantage that the perfectly conserved probes have, of allowing direct comparison between human and mouse samples, but they can be necessary for complete coverage of psycho-neuroendocrine-immune gene expression.

173. The first iteration of the PNI array has relatively few probes designed to differentiate between transcriptional variants, yet the functional differences between these variants make it important that they be distinguished on the second iteration. Lastly, the average number of probes per gene can be reduced on the second iteration, by selecting empirically determined optimal probes using the first iteration PNI array.

174. The Nimblegen 1st iteration PNI array has three adjacent replicates of the PNI array, and that the configuration of probes is randomized in each, but that the

location of each probe can be identified unambiguously. As shown in figures 16 and 17, for a given probe sequence, there is some inter-slide variability. However, the reproducibility was quite good. For the 12259 PNI probes where at least one of the three replicates had a sARMdens/background ratio of 2.5 or greater, the maximum and minimum log2sARM signal intensity was calculated, and the max/min ratio was calculated. The mean ratio was 1.27, and 95% of all max/min ratios fell between 1.21 and 1.33. There was only a slight position effect between the three replicate arrays, and signal intensities were distributed similarly overall.

Table 5

Probe Type	Gene or Variant	Number of probes
NoSplice	A	7
NoSplice	A2M	1
NoSplice	AANAT	6
NoSplice	ABAT	10
NoSplice	ABCB1	42
Common	ACHE	15
Unique	ACHE vE4-E6	5
Housekeeping Mismatch	ACTB	16
Housekeeping	ACTB	4
NoSplice	ADA	4
NoSplice	ADCYAP1	12
NoSplice	ADCYAP1R1	15
NoSplice	ADRA2A	7
NoSplice	ADRBK1	3
NoSplice	ADRBK2	13
NoSplice	AGRP	3
NoSplice	AHR	12
Common	AIF1	3
Unique	AIF1 v3	9
NoSplice	AIG-1	13
NoSplice	AIP	40
NoSplice	AKR1C3	5
NoSplice	AKT1	26
NoSplice	ALDH1A1	28
NoSplice	ALDH1A2	12
NoSplice	ALDH1A3	5
NoSplice	ALDH1B1	6
NoSplice	ALDH2	32
NoSplice	ALDH3A1	1
NoSplice	ALDH3A2	23
Common	ALDH5A1	2
NoSplice	ALDH6A1	19
NoSplice	ALDH7A1	4
NoSplice	ALDH9A1	8
NoSplice	ALOX12B	20

NoSplice	ALOX15B	7
NoSplice	ALOX5	8
NoSplice	ALOX5AP	7
NoSplice	ALOXE3	8
NoSplice	AMH	7
NoSplice	AMHR2	5
NoSplice	ANXA1	6
NoSplice	ANXA11	10
NoSplice	ANXA13	26
NoSplice	ANXA2	7
NoSplice	ANXA3	18
NoSplice	ANXA4	16
NoSplice	ANXA5	21
Common	ANXA6	9
NoSplice	ANXA8	47
NoSplice	APBA1	5
NoSplice	APBA2	40
NoSplice	APBA3	4
NoSplice	APLP1	8
NoSplice	APOE	2
NoSplice	APP	9
NoSplice	AR	5
NoSplice	ARIX	24
NoSplice	ARNTL	6
Common	ARRB1	19
NoSplice	ASCL1	9
NoSplice	ASIP	18
NoSplice	ATF2	11
NoSplice	AVPR1A	8
NoSplice	AVPR1B	7
NoSplice	AVPR2	9
NoSplice	B2M	1
NoSplice	B7-H3	5
Common	BACE	14
Common	BACE2	3
NoSplice	BAT1	1
NoSplice	BATF	3
Shared	BAX	1
NoSplice	BBOX1	7
Common	BCL2	6
NoSplice	BCL2A1	5
Common	BCL2L1	3
Unique	BCL2L1 v1	15
NoSplice	BCL2L2	16
NoSplice	BDKRB1	25
NoSplice	BDKRB2	8
NoSplice	BDNF	18
NoSplice	BF	3
Common	BLR1	2
NoSplice	BMX	7
NoSplice	BRE	11

NoSplice	BRS3	4
NoSplice	BTK	12
NoSplice	C1QBP	13
NoSplice	C1R	4
NoSplice	C1S	3
NoSplice	C2	3
NoSplice	C3	5
NoSplice	C4B	6
NoSplice	C4BPA	2
NoSplice	C5	7
NoSplice	C5R1	3
NoSplice	C6	37
NoSplice	C7	7
NoSplice	C8A	6
NoSplice	C8B	20
NoSplice	C9	5
Arabidopsis	CAB	16
NoSplice	CACNA1B	5
NoSplice	CACNA1D	12
NoSplice	CACNB1	9
NoSplice	CACNB2	7
NoSplice	CACNB3	4
NoSplice	CACNB4	3
NoSplice	CACNG2	12
NoSplice	CADPS	4
NoSplice	CALCA	1
NoSplice	CALCB	2
NoSplice	CALCRL	26
NoSplice	CALCYON	8
NoSplice	CALR	11
NoSplice	CAMLG	12
NoSplice	CANX	3
NoSplice	CARD10	4
NoSplice	CARP	18
Common	CASP2	9
Common	CASP3	6
Common	CASP6	2
Common	CASP9	2
Unique	CASP9 vA	9
NoSplice	CCKAR	11
NoSplice	CCKBR	1
NoSplice	CCL19	4
NoSplice	CCL21	1
NoSplice	CCL5	9
Common	CCR2	5
NoSplice	CCR4	2
NoSplice	CCR5	8
NoSplice	CCR7	10
NoSplice	CCR8	1
NoSplice	CCRL1	3
NoSplice	CD19	10

NoSplice	CD3E	12
NoSplice	CD3G	5
NoSplice	CD3Z	5
NoSplice	CD4	17
NoSplice	CD44	3
NoSplice	CD81	9
NoSplice	CD84	9
NoSplice	CDC37	2
NoSplice	CDKN1C	18
NoSplice	CDR2	9
NoSplice	CDV-1	3
NoSplice	CDX1	1
NoSplice	CEBPA	6
NoSplice	CEBPB	5
NoSplice	CEBPG	7
Housekeeping	CFL1	43
NoSplice	CFTR	8
NoSplice	CGA	3
Common	CHAT	17
NoSplice	CHRM1	3
NoSplice	CHRM2	15
NoSplice	CHRM3	8
NoSplice	CHRM4	3
NoSplice	CHRM5	22
NoSplice	CHRNA1	3
NoSplice	CHRNA10	15
NoSplice	CHRNA2	5
NoSplice	CHRNA3	36
NoSplice	CHRNA4	3
NoSplice	CHRNA5	7
NoSplice	CHRNA6	3
NoSplice	CHRNA7	11
NoSplice	CHRNA9	3
NoSplice	CHRNB1	5
NoSplice	CHRNB2	37
NoSplice	CHRNB3	13
NoSplice	CHRNB4	3
NoSplice	CHRND	42
NoSplice	CHRNE	9
NoSplice	CHRNG	59
NoSplice	CHUK	15
NoSplice	CIAS1	4
NoSplice	CISH	4
NoSplice	CLC	7
NoSplice	CLOCK	13
NoSplice	CLU	3
NoSplice	CMKLR1	10
NoSplice	CML66	9
NoSplice	CNIH	7
NoSplice	CNOT2	14
NoSplice	CNR2	6

NoSplice	CNTF	24
NoSplice	CNTFR	5
NoSplice	COASTER	13
NoSplice	CPE	5
NoSplice	CPT1C	32
NoSplice	CPT2	11
NoSplice	CR2	2
NoSplice	CREBBP	10
NoSplice	CRHR1	3
NoSplice	CRHR2	9
NoSplice	CRL3	7
NoSplice	CROT	7
NoSplice	CRP	7
NoSplice	CRYAB	4
NoSplice	CSF1	6
NoSplice	CSF1R	4
NoSplice	CSF2RB	11
NoSplice	CSNK1E	4
NoSplice	CST	3
NoSplice	CST7	5
NoSplice	CTLA4	5
NoSplice	CTSD	1
NoSplice	CTSW	24
NoSplice	CX3CR1	20
NoSplice	CXCL12	20
NoSplice	CXCL14	11
NoSplice	CXCL3	21
NoSplice	CXCL9	1
NoSplice	CXCR3	3
NoSplice	CXCR4	5
NoSplice	CXCR6	4
NoSplice	CYP11A	5
NoSplice	CYP1A1	4
NoSplice	CYP1A2	3
NoSplice	CYP1B1	8
NoSplice	CYP21A2	6
NoSplice	CYP24	9
NoSplice	CYP27A1	8
NoSplice	CYP27B1	3
Common	CYP2A7	5
NoSplice	CYP2B6	2
NoSplice	CYP2C18	9
NoSplice	CYP2C9	18
NoSplice	CYP2D6	1
NoSplice	CYP2E1	6
NoSplice	CYP2J2	21
NoSplice	CYP39A1	5
NoSplice	CYP46	17
NoSplice	CYP4A11	8
NoSplice	CYP4B1	53
NoSplice	CYP4F11	7

NoSplice	CYP4F2	6
NoSplice	CYP51	25
NoSplice	CYP7A1	9
NoSplice	CYP7B1	5
NoSplice	CYP8B1	5
NoSplice	CYSLTR1	11
NoSplice	CYSLTR2	12
NoSplice	CYT19	5
NoSplice	DAP	5
NoSplice	DAPK1	5
NoSplice	DAT1	6
NoSplice	DBH	15
NoSplice	DBP	5
NoSplice	DDC	16
NoSplice	DIO2	19
NoSplice	DIO3	4
NoSplice	DLG3	9
NoSplice	DLK1	7
NoSplice	DMGDH	11
NoSplice	DPP4	9
Common	DPP8	14
NoSplice	DRD1	15
Common	DRD2	19
Unique	DRD2 v1	4
Common	DRD3	3
NoSplice	DRD4	6
NoSplice	DRD5	3
NoSplice	DUSP1	4
Common	DUSP10	3
Unique	DUSP10 v1	13
NoSplice	DUSP11	2
NoSplice	DUSP12	11
NoSplice	DUSP13	8
NoSplice	DUSP14	12
Common	DUSP15	16
NoSplice	DUSP18	6
NoSplice	DUSP19	6
NoSplice	DUSP22	4
NoSplice	DUSP3	23
Common	DUSP4	1
Junction	DUSP4v1	30
NoSplice	DUSP5	5
NoSplice	DUSP7	29
NoSplice	DUSP8	13
NoSplice	E2IG5	2
NoSplice	EAF1	13
NoSplice	EAT2	3
NoSplice	EBAG9	3
NoSplice	EBI2	5
NoSplice	ED1	12
NoSplice	EDN2	5

Housekeeping	EEF1G	27
NoSplice	EFNA1	55
NoSplice	EFNA2	3
NoSplice	EFNA3	34
NoSplice	EFNA5	16
NoSplice	EFNB1	4
NoSplice	EFNB2	8
NoSplice	EFNB3	17
NoSplice	EGF	7
NoSplice	EGFR	5
NoSplice	EGR1	13
NoSplice	EI24	12
NoSplice	ELK1	4
NoSplice	EMR1	3
NoSplice	EN1	3
NoSplice	EN2	12
NoSplice	ENO1	39
NoSplice	ENSA	5
NoSplice	EPHA1	14
NoSplice	EPHA2	5
NoSplice	EPHA3	3
NoSplice	EPHA4	5
NoSplice	EPHA5	10
NoSplice	EPHA7	13
NoSplice	EPHA8	35
NoSplice	EPHB1	6
Common	EPHB2	7
NoSplice	EPHB3	10
NoSplice	EPHB4	56
NoSplice	EPHX2	3
NoSplice	EPS15	6
NoSplice	EPS15R	8
NoSplice	ERBB2	4
NoSplice	ERBB3	11
NoSplice	ESR1	19
NoSplice	ESR2	20
NoSplice	ESRRA	14
NoSplice	ESRRB	3
NoSplice	ETS1	5
NoSplice	FADD	3
NoSplice	FADS1	5
Common	FAF1	3
Unique	FAF1 v1	3
NoSplice	FCGBP	15
NoSplice	FCGR1A	6
NoSplice	FCGRT	4
Common	FGF1	4
Unique	FGF1 v1	10
NoSplice	FGF2	21
NoSplice	FGF3	4
NoSplice	FIGF	9

NoSplice	FKBP1A	1
Common	FKBP1B	10
Unique	FKBP1B v1	5
Junction	FKBP1B v2	2
NoSplice	FKBP2	15
NoSplice	FKBP3	5
NoSplice	FKBP4	30
NoSplice	FKBP5	5
NoSplice	FKBP6	5
NoSplice	FKBP8	13
NoSplice	FLJ12541	21
NoSplice	FLT3	10
NoSplice	FLT3LG	5
NoSplice	FOS	18
NoSplice	FOXA1	27
NoSplice	FOXA2	1
NoSplice	FOXA3	7
NoSplice	FOXP3	8
NoSplice	FSHB	12
NoSplice	FSHR	4
Housekeeping-mismatch	FTL	44
Housekeeping	FTL	11
NoSplice	FURIN	6
NoSplice	FUS	45
NoSplice	FYB	11
NoSplice	GAB1	8
Common	GAB2	13
Unique	GAB2 v1	4
NoSplice	GABARAP	17
Common	GABBR1	18
NoSplice	GABRA1	3
NoSplice	GABRA2	11
NoSplice	GABRA3	7
NoSplice	GABRA4	8
NoSplice	GABRA5	20
NoSplice	GABRA6	16
NoSplice	GABRB1	29
NoSplice	GABRD	14
NoSplice	GABRG2	10
NoSplice	GABRG3	7
NoSplice	GABRP	15
NoSplice	GABRQ	6
NoSplice	GABRR1	9
NoSplice	GABRR2	6
Common	GAD1	3
NoSplice	GAD2	9
NoSplice	GADD45A	11
NoSplice	GADD45G	12
NoSplice	GALR1	34
NoSplice	GALR2	38
NoSplice	GALR3	13

Housekeeping	GAPD	13
NoSplice	GATA3	15
NoSplice	GBP1	14
NoSplice	GBP2	7
NoSplice	GBP4	18
NoSplice	GBP5	2
NoSplice	GCG	3
Common	GCK	4
NoSplice	GCKR	15
NoSplice	GDF10	4
NoSplice	GDNF	9
NoSplice	GFAP	20
Common	GFRA1	13
NoSplice	GFRA2	4
NoSplice	GFRA3	5
NoSplice	GGTLA1	6
NoSplice	GHITM	13
NoSplice	GHRHR	15
NoSplice	GHSR	5
NoSplice	GIOT-3	7
NoSplice	GLRA1	5
Common	GMEB1	5
Junction	GMEB1v1	2
Junction	GMEB1v2	2
NoSplice	GMEB2	7
NoSplice	GMFB	18
NoSplice	GMFG	5
NoSplice	GNAS	3
NoSplice	GNRH1	10
NoSplice	GNRHR	4
NoSplice	GPB5	2
NoSplice	GPHA2	5
NoSplice	GPHN	15
NoSplice	GPR10	17
NoSplice	GPR14	3
NoSplice	GPR17	8
NoSplice	GPR2	1
NoSplice	GPR24	6
NoSplice	GPR30	35
NoSplice	GPR39	9
NoSplice	GPR48	8
NoSplice	GPR49	7
NoSplice	GPR50	7
NoSplice	GPR51	11
NoSplice	GPR57	7
NoSplice	GPR58	4
NoSplice	GPR66	3
NoSplice	GPR81	5
NoSplice	GPX1	6
NoSplice	GRAP2	3
NoSplice	GRB7	21

Common	GREB1	3
Unique	GREB1 va	15
NoSplice	GRIA1	7
NoSplice	GRIA2	10
NoSplice	GRIA4	8
NoSplice	GRID2	12
NoSplice	GRIN2D	3
NoSplice	GRM1	5
NoSplice	GRM2	18
NoSplice	GRM3	3
NoSplice	GRM5	7
NoSplice	GRM6	7
NoSplice	GRM7	7
NoSplice	GRM8	5
NoSplice	GRPR	30
NoSplice	GRTP1	17
NoSplice	GSR	14
NoSplice	GSTA3	3
NoSplice	GSTM3	3
NoSplice	GZMM	3
NoSplice	HAL	23
NoSplice	HARC	3
NoSplice	HCRT	4
NoSplice	HCRTR1	6
NoSplice	HCRTR2	12
NoSplice	HDAC3	13
NoSplice	HDC	11
NoSplice	HGF	11
NoSplice	HGFAC	3
NoSplice	HGS	6
NoSplice	HIP1	17
NoSplice	HK2	4
NoSplice	HLA-A	1
NoSplice	HLA-B	1
NoSplice	HLA-DNA	3
Housekeeping	HLA-DOA	3
NoSplice	HLA-DQA1	10
NoSplice	HLA-DRB1	3
NoSplice	HLALS	3
NoSplice	HM74	6
NoSplice	HMOX1	2
NoSplice	HMOX2	3
NoSplice	HOXA1	6
NoSplice	HOXB1	5
NoSplice	HRH1	9
NoSplice	HRH2	15
NoSplice	HRH3	52
NoSplice	HSD11B1	9
NoSplice	HSD11B2	3
NoSplice	HSD17B3	3
NoSplice	HSD17B8	8

NoSplice	HSF1	3
NoSplice	HSOBRGRP	3
NoSplice	HSP105B	13
NoSplice	HSPA1A	3
NoSplice	HSPA1L	8
NoSplice	HSPA2	3
NoSplice	HSPA4	5
NoSplice	HSPA5	3
NoSplice	HSPA6	19
Common	HSPA8	7
NoSplice	HSPA9B	40
NoSplice	HSPB1	3
NoSplice	HSPB2	6
NoSplice	HSPB3	3
NoSplice	HSPB7	4
NoSplice	HSPC228	3
NoSplice	HSPCA	3
NoSplice	HSPCB	4
NoSplice	HSPD1	7
NoSplice	HTR1A	24
NoSplice	HTR1B	14
NoSplice	HTR1D	11
NoSplice	HTR1F	8
NoSplice	HTR2A	18
NoSplice	HTR2B	7
NoSplice	HTR2C	27
NoSplice	HTR3A	9
NoSplice	HTR4	4
NoSplice	HTR6	4
Common	HTR7	3
NoSplice	IAN4L1	3
NoSplice	ICAM5	11
NoSplice	ICSBP1	15
NoSplice	IDE	18
NoSplice	IFI35	8
NoSplice	IFI44	3
NoSplice	IFIT1	1
NoSplice	IFIT2	12
NoSplice	IFRD1	6
NoSplice	IFRD2	3
NoSplice	IGF1	6
NoSplice	IGF1R	7
NoSplice	IGF2	8
NoSplice	IGFBP2	5
NoSplice	IGFBP3	9
NoSplice	IGFBP4	41
NoSplice	IGFBP5	3
NoSplice	IKBKAP	13
NoSplice	IKBKB	6
NoSplice	IKBKE	39
NoSplice	IKBKG	6

NoSplice	IL-17RC	4
Common	IL-17RE	8
NoSplice	IL-23R	3
NoSplice	IL10RB	5
Common	IL11RA	15
NoSplice	IL12B	11
NoSplice	IL12RB2	1
NoSplice	IL13RA1	3
NoSplice	IL13RA2	1
NoSplice	IL15	7
NoSplice	IL16	3
NoSplice	IL17	2
NoSplice	IL17B	8
NoSplice	IL17BR	6
NoSplice	IL17E	3
NoSplice	IL17R	7
NoSplice	IL18BP	5
NoSplice	IL18RAP	7
NoSplice	IL19	1
NoSplice	IL1B	7
NoSplice	IL1R1	9
NoSplice	IL1RAPL1	8
NoSplice	IL1RAPL2	16
NoSplice	IL20RA	8
NoSplice	IL21R	6
NoSplice	IL22	7
NoSplice	IL22R	6
NoSplice	IL24	1
NoSplice	IL28RA	2
NoSplice	IL2RA	3
NoSplice	IL2RB	9
NoSplice	IL2RG	4
NoSplice	IL6ST	3
NoSplice	IL8RB	14
NoSplice	ILF1	10
NoSplice	ILF2	3
Common	ILF3	11
NoSplice	INHA	16
NoSplice	INHBA	9
NoSplice	INHBC	4
NoSplice	INS	16
NoSplice	INSIG1	13
NoSplice	INSIG2	3
NoSplice	INSM1	32
NoSplice	INSR	12
NoSplice	IPF1	8
NoSplice	IRAK1	3
NoSplice	IRAK2	7
NoSplice	IRAK3	8
NoSplice	IRF1	16
NoSplice	IRF2	13

NoSplice	IRF4	23
MultiVar	IRF5	18
NoSplice	IRF6	12
MultiVar	IRF7	4
NoSplice	IRS1	6
NoSplice	IRS2	3
NoSplice	IRS4	10
NoSplice	ISGF3G	8
NoSplice	ITGA1	13
NoSplice	ITGA2	4
NoSplice	ITGA3	3
NoSplice	ITGA4	8
NoSplice	ITGA5	44
NoSplice	ITGA6	6
NoSplice	ITGAL	13
NoSplice	ITGAM	5
NoSplice	ITGAX	9
NoSplice	ITK	57
NoSplice	ITM2B	16
NoSplice	JAK1	9
NoSplice	JAK2	7
NoSplice	JAK3	6
NoSplice	JAM2	11
NoSplice	JUN	27
NoSplice	JUNB	4
NoSplice	KIT	6
NoSplice	KLF16	4
NoSplice	KLK2	1
NoSplice	KPNB2	7
NoSplice	LAT	2
NoSplice	LCK	16
NoSplice	LCN7	3
NoSplice	LCP1	4
NoSplice	LCP2	25
NoSplice	LEC2	29
NoSplice	LEP	18
NoSplice	LEPR	4
NoSplice	LGALS3BP	7
NoSplice	LHCGR	17
NoSplice	LHX3	2
NoSplice	LIF	3
NoSplice	LIFR	10
NoSplice	LIPE	16
NoSplice	LNPEP	3
NoSplice	LOC134728	19
NoSplice	LOC152503	6
NoSplice	LOC55971	11
NoSplice	LOC56920	3
NoSplice	LRBA	17
MultiVar	LRDD	3
NoSplice	LTA	12

NoSplice	LTA4H	11
MultiVar	LTB	8
NoSplice	LTB4R	5
NoSplice	LTB4R2	18
NoSplice	LTBR	1
Arabidopsis-biotinylated	LTP4	16
Arabidopsis	LTP6	18
MultiVar	MADD	30
NoSplice	MAFF	2
NoSplice	MAGED1	6
NoSplice	MAOA	6
NoSplice	MAOB	21
NoSplice	MAP2K1	34
MultiVar	MAP2K3	13
NoSplice	MAP2K4	4
MultiVar	MAP2K6	34
MultiVar	MAP2K7	13
NoSplice	MAP3K10	9
NoSplice	MAP3K11	3
NoSplice	MAP3K12	3
NoSplice	MAP3K13	4
NoSplice	MAP3K2	8
NoSplice	MAP3K3	11
MultiVar	MAP3K4	12
MultiVar	MAP3K7	29
NoSplice	MAP3K8	17
NoSplice	MAP4K1	8
NoSplice	MAP4K3	5
MultiVar	MAPK1	1
MultiVar	MAPK10	16
NoSplice	MAPK13	3
MultiVar	MAPK14	17
MultiVar	MAPK8	18
NoSplice	MAPK8IP1	3
MultiVar	MAPK8IP2	3
MultiVar	MAPK9	32
MultiVar	MAPKAPK2	6
MultiVar	MASP1	4
MultiVar	MASP2	32
MultiVar	MATK	29
NoSplice	MAZ	9
NoSplice	MBP	17
NoSplice	MC1R	6
NoSplice	MC2R	3
NoSplice	MC3R	24
NoSplice	MC4R	8
NoSplice	MDK	1
NoSplice	MEF2C	7
NoSplice	MEIS2	18
NoSplice	MET	14
NoSplice	MHC2TA	6

NoSplice	MIF	5
NoSplice	MIG-6	11
NoSplice	MIZIP	12
NoSplice	MKNK2	71
NoSplice	MME	11
NoSplice	MMP2	8
NoSplice	MMP3	8
NoSplice	MMP8	39
NoSplice	MMP9	11
NoSplice	MPL	10
NoSplice	MS4A3	2
NoSplice	MST1	4
NoSplice	MST1R	6
NoSplice	MT2A	1
NoSplice	MT3	13
NoSplice	MTNR1B	7
NoSplice	MX2	8
NoSplice	MYC	14
NoSplice	MYD88	3
NoSplice	N-PAC	12
NoSplice	NAALAD2	1
Arabidopsis	NAC1	14
NoSplice	NCAM1	4
MultiVar	NCOA1	52
NoSplice	NCOA2	11
NoSplice	NCOA3	6
NoSplice	NCOA4	14
NoSplice	NCOA5	7
NoSplice	NCOA6	32
NoSplice	NCOA6IP	5
NoSplice	NCSTN	10
NoSplice	NELL2	17
NoSplice	NFATC1	2
NoSplice	NFATC3	15
NoSplice	NFIL3	1
NoSplice	NFKB1	15
NoSplice	NFKB2	5
NoSplice	NFKBIA	42
NoSplice	NFKBIE	3
NoSplice	NFKBIL1	7
NoSplice	NFRKB	5
MultiVar	NFX1	16
NoSplice	NGFB	29
NoSplice	NGFR	6
NoSplice	NGFRAP1	2
NoSplice	NMB	4
NoSplice	NMBR	6
NoSplice	NOS1	7
MultiVar	NOS2A	12
NoSplice	NOS3	7
NoSplice	NOSIP	12

NoSplice	NOSTRIN	10
NoSplice	NPFF	10
NoSplice	NPPC	2
MultiVar	NPR2	68
NoSplice	NPR3	20
NoSplice	NPY1R	2
NoSplice	NPY2R	11
NoSplice	NPY5R	7
NoSplice	NR0B1	10
NoSplice	NR1	4
NoSplice	NR1D1	5
NoSplice	NR1D2	4
NoSplice	NR1H2	3
NoSplice	NR1H3	3
NoSplice	NR1H4	2
MultiVar	NR1I2	13
NoSplice	NR2C1	13
NoSplice	NR2C2	5
NoSplice	NR2E1	14
NoSplice	NR2F1	3
NoSplice	NR2F2	4
NoSplice	NR2F6	3
NoSplice	NR3C1	20
NoSplice	NR3C2	9
NoSplice	NR4A1	5
NoSplice	NR4A2	16
NoSplice	NR4A3	6
NoSplice	NR5A1	4
NoSplice	NR5A2	8
NoSplice	NR6A1	10
NoSplice	NRBF-2	6
NoSplice	NRF	7
MultiVar	NRG1	11
MultiVar	NRG2	26
NoSplice	NRGN	11
NoSplice	NRIP1	10
NoSplice	NRP2	10
NoSplice	NRTN	5
NoSplice	NS	3
NoSplice	NSEP1	3
NoSplice	NTF3	3
NoSplice	NTF5	10
NoSplice	NTRK1	22
NoSplice	NTRK2	3
NoSplice	NTRK3	10
NoSplice	NTS	21
NoSplice	NTSR2	7
NoSplice	NTT5	4
NoSplice	NTT73	9
NoSplice	NXPH1	5
NoSplice	NYREN18	8

NoSplice	OAT	12
NoSplice	ODC1	5
NoSplice	OPRK1	3
NoSplice	OT7T022	8
NoSplice	OXT	5
NoSplice	OXTR	23
NoSplice	P38IP	4
NoSplice	PACE4	4
NoSplice	PADI5	4
NoSplice	PAK1	5
NoSplice	PAPPA	4
NoSplice	PC	8
NoSplice	PCSK1	11
NoSplice	PCSK1N	18
NoSplice	PCSK2	12
MultiVar	PDCD4	16
MultiVar	PDGFA	4
NoSplice	PDGFB	3
NoSplice	PDGFC	5
NoSplice	PDGFRA	8
NoSplice	PDGFRB	9
NoSplice	PDGFRL	1
NoSplice	PECAM1	4
NoSplice	PER1	7
MultiVar	PER2	12
NoSplice	PER3	8
NoSplice	PERC	7
NoSplice	PGDS	4
NoSplice	PGR	4
NoSplice	PGRMC1	6
NoSplice	PGRMC2	8
NoSplice	PI4K2B	28
NoSplice	PIAS1	12
NoSplice	PIGR	7
NoSplice	PIK3CG	10
NoSplice	PLA2G4A	10
NoSplice	PLA2G6	10
NoSplice	PLA2R1	9
MultiVar	PLAC3	54
NoSplice	PLG	3
NoSplice	PLTP	3
NoSplice	PLXNB1	5
NoSplice	PLXNC1	30
NoSplice	PMCH	10
NoSplice	PMCHL1	14
NoSplice	PMX2B	10
NoSplice	PNMT	4
NoSplice	PNOC	4
NoSplice	PNR	3
NoSplice	POLE4	7
NoSplice	POMC	3

NoSplice	POR	20
NoSplice	POU1F1	12
NoSplice	PPARD	5
NoSplice	PPARGC1	13
MultiVar	PPM1A	31
NoSplice	PPM1D	20
NoSplice	PPP1R1B	14
NoSplice	PPYR1	11
NoSplice	PRDM1	11
NoSplice	PREB	32
NoSplice	PRH	2
NoSplice	PRKCA	5
NoSplice	PRKCB1	16
NoSplice	PRKCD	11
NoSplice	PRKCE	7
NoSplice	PRKRIR	5
Arabidopsis	PRKase	18
NoSplice	PRLR	2
NoSplice	PRSS11	25
NoSplice	PRX	5
NoSplice	PSAP	4
MultiVar	PSCD2	49
NoSplice	PSEN1	5
MultiVar	PSMB9	4
NoSplice	PTCH	10
NoSplice	PTCH2	3
NoSplice	PTGDR	23
NoSplice	PTGDS	2
NoSplice	PTGER1	14
NoSplice	PTGER2	3
NoSplice	PTGER3	9
NoSplice	PTGER4	4
NoSplice	PTGES2	8
NoSplice	PTGFR	3
NoSplice	PTGIR	10
NoSplice	PTGIS	6
MultiVar	PTGS1	2
NoSplice	PTGS2	19
NoSplice	PTH	7
NoSplice	PTHLH	8
NoSplice	PTHR1	3
NoSplice	PTHR2	3
NoSplice	PTMA	6
NoSplice	PTN	12
NoSplice	PTPN1	8
NoSplice	PTPN18	20
MultiVar	PTPN2	10
MultiVar	PTPN22	4
NoSplice	PTPN3	17
NoSplice	PTPN4	13
MultiVar	PTPN6	27

MultiVar	PTPN7	19
NoSplice	PTPN9	7
NoSplice	PTPNS1	7
MultiVar	PTPRC	14
NoSplice	PTPRK	7
NoSplice	PTPRN	43
NoSplice	PTX3	13
NoSplice	RAF1	13
NoSplice	RAG1	10
NoSplice	RAG2	9
NoSplice	RAI	7
NoSplice	RAMP2	1
NoSplice	RAMP3	6
NoSplice	RARA	36
MultiVar	RARB	7
NoSplice	RARRES3	5
NoSplice	RASD1	4
NoSplice	RBP2	3
Arabidopsis	RCA	15
Arabidopsis	RCP1	15
NoSplice	RDC1	5
NoSplice	REA	10
NoSplice	RELB	12
NoSplice	RFC1	12
NoSplice	RFRP	5
MultiVar	RFX2	3
NoSplice	RFXAP	10
NoSplice	RGC32	19
NoSplice	RGN	6
NoSplice	RGS19IP1	23
NoSplice	RGS9	19
NoSplice	RNPEPL1	5
NoSplice	RODH	9
NoSplice	RORA	12
NoSplice	RORB	6
NoSplice	RORC	30
Housekeeping	RPL10A	24
Housekeeping	RPL37A	22
NoSplice	RPS10	3
Housekeeping	RPS21	12
NoSplice	RPS5	14
NoSplice	RTN1	18
NoSplice	RTN2	11
NoSplice	RTN3	3
NoSplice	RTN4	5
NoSplice	RXRA	54
NoSplice	RXRB	26
NoSplice	RelA	13
NoSplice	SAMHD1	3
NoSplice	SCAMP2	16
NoSplice	SCAP1	2

NoSplice	SCAP2	10
NoSplice	SCG2	28
NoSplice	SCGN	8
NoSplice	SCN1A	8
NoSplice	SCN1B	16
NoSplice	SCN2A2	3
NoSplice	SCN2B	20
NoSplice	SCN3A	3
NoSplice	SCN4A	39
NoSplice	SCN5A	8
NoSplice	SCN7A	15
NoSplice	SCN9A	6
NoSplice	SCP2	3
NoSplice	SCT	4
NoSplice	SCYE1	13
NoSplice	SELE	6
NoSplice	SELPLG	6
NoSplice	SEMA3A	20
NoSplice	SEMA3B	3
NoSplice	SEMA3C	3
NoSplice	SEMA3D	13
NoSplice	SEMA3E	15
NoSplice	SEMA3F	9
NoSplice	SEMA4C	3
NoSplice	SEMA4D	6
NoSplice	SEMA4F	8
NoSplice	SEMA4G	8
NoSplice	SEMA5A	9
NoSplice	SEMA5B	4
NoSplice	SEMA6A	9
MultiVar	SEMA6B	9
MultiVar	SEMA6D	17
NoSplice	SEMA7A	9
NoSplice	SERPINA6	2
NoSplice	SERPINE1	14
NoSplice	SFRS5	3
MultiVar	SGKL	5
NoSplice	SGNE1	3
NoSplice	SHARP	6
NoSplice	SHBG	7
NoSplice	SHC1	36
NoSplice	SHC3	17
NoSplice	SIGLEC5	1
NoSplice	SITPEC	9
NoSplice	SLC11A1	6
NoSplice	SLC11A2	14
NoSplice	SLC15A2	8
NoSplice	SLC18A1	6
NoSplice	SLC18A2	7
NoSplice	SLC18A3	3
NoSplice	SLC1A1	16

NoSplice	SLC1A2	18
NoSplice	SLC1A3	24
NoSplice	SLC21A2	6
NoSplice	SLC22A3	12
NoSplice	SLC22A5	3
NoSplice	SLC25A20	25
MultiVar	SLC25A3	3
NoSplice	SLC25A4	7
NoSplice	SLC25A5	12
NoSplice	SLC29A1	4
NoSplice	SLC2A4	3
NoSplice	SLC6A1	61
NoSplice	SLC6A11	32
NoSplice	SLC6A12	31
NoSplice	SLC6A13	5
NoSplice	SLC6A14	24
NoSplice	SLC6A2	17
NoSplice	SLC6A3	6
NoSplice	SLC6A4	4
NoSplice	SLC6A5	8
NoSplice	SLC6A6	4
NoSplice	SLC6A7	28
NoSplice	SLC6A8	23
NoSplice	SLC6A9	4
MultiVar	SMARCA2	39
NoSplice	SMARCA4	26
MultiVar	SMARCF1	86
MultiVar	SNAP23	12
NoSplice	SNAP29	2
NoSplice	SNT-1	17
NoSplice	SNT-2	10
NoSplice	SNW1	8
MultiVar	SNX15	2
NoSplice	SNX4	21
MultiVar	SNX6	2
NoSplice	SOCS1	13
NoSplice	SOCS2	38
NoSplice	SOCS3	6
NoSplice	SOD2	16
NoSplice	SPC	2
MultiVar	SPINT1	2
NoSplice	SPINT2	6
NoSplice	SPN	2
NoSplice	SPP1	6
MultiVar	SR-BP1	1
NoSplice	SRC	28
NoSplice	SRY	1
NoSplice	SSBP1	4
NoSplice	SST	7
MultiVar	STAT1	23
NoSplice	STAT2	4

MultiVar	STAT3	25
NoSplice	STAT4	10
NoSplice	STAT5A	23
MultiVar	SYN1	41
MultiVar	SYN2	37
MultiVar	SYN3	6
MultiVar	TAC1	6
MultiVar	TACR1	13
MultiVar	TAF9	11
MultiVar	TBXAS1	17
MultiVar	TCIRG1	28
NoSplice	TFE3	31
NoSplice	TFRC	5
NoSplice	TGFA	8
NoSplice	TGFB1	3
NoSplice	TGFB2	10
NoSplice	TGFB3	5
NoSplice	THPO	13
NoSplice	THRA	12
NoSplice	THRB	3
NoSplice	THRSP	14
NoSplice	TIAF1	7
Arabidopsis	TIM	10
NoSplice	TIMELESS	8
NoSplice	TIMM23	7
NoSplice	TIMP2	7
NoSplice	TIMP3	17
NoSplice	TIMP4	5
MultiVar	TIRAP	3
NoSplice	TLOC1	5
NoSplice	TLR1	3
NoSplice	TLR2	13
NoSplice	TLR3	13
NoSplice	TLR5	3
NoSplice	TLR6	15
NoSplice	TLR7	17
MultiVar	TLR8	15
NoSplice	TMSB4X	17
NoSplice	TNFRSF11A	7
NoSplice	TNFRSF11B	7
MultiVar	TNFRSF19	9
NoSplice	TNFRSF19L	5
NoSplice	TNFRSF1A	4
NoSplice	TNFRSF1B	12
NoSplice	TNFRSF21	4
NoSplice	TNFRSF4	3
MultiVar	TNFRSF6B	3
MultiVar	TNFSF12	6
NoSplice	TNFSF13	2
NoSplice	TNFSF13B	13
NoSplice	TNFSF15	2

NoSplice	TNFSF5	1
NoSplice	TNFSF6	3
NoSplice	TNFSF8	3
NoSplice	TOMM70A	8
NoSplice	TP53	7
NoSplice	TPH	7
NoSplice	TPT1	18
MultiVar	TRADD	1
NoSplice	TRAF1	11
MultiVar	TRAF2	2
MultiVar	TRAF3	31
NoSplice	TRAF6	7
NoSplice	TRAP100	8
NoSplice	TRAP150	3
NoSplice	TRAP240	16
NoSplice	TRHDE	11
NoSplice	TRHR	13
NoSplice	TRIAD3	13
NoSplice	TRIM	2
NoSplice	TRIP	10
NoSplice	TRIP10	3
NoSplice	TRIP11	6
NoSplice	TRIP12	12
NoSplice	TRIP13	3
NoSplice	TRIP15	7
NoSplice	TRIP3	5
NoSplice	TRIP4	9
MultiVar	TRO	25
NoSplice	TRP	38
NoSplice	TRPM2	6
NoSplice	TSHB	10
NoSplice	TSHR	8
NoSplice	TXNIP	6
NoSplice	TYK2	5
NoSplice	UBC	2
NoSplice	UBP1	16
NoSplice	UCHL1	11
NoSplice	UCN	2
NoSplice	UGTREL1	21
NoSplice	VAMP2	35
NoSplice	VDAC1	3
NoSplice	VDAC2	3
NoSplice	VDAC3	30
NoSplice	VDR	7
NoSplice	VIAAT	7
NoSplice	VIPR1	13
NoSplice	VIPR2	3
NoSplice	VSNL1	11
NoSplice	WAS	8
NoSplice	WASF1	3
MultiVar	WISP1	20

NoSplice	WISP2	8
NoSplice	WNT1	3
NoSplice	WNT10B	12
NoSplice	WNT2	4
MultiVar	WSB1	18
Arabidopsis	XCP2	13
NoSplice	XCR1	6
NoSplice	YARS	13
NoSplice	YWHAB	4
NoSplice	ZAP-70	17
NoSplice	ZFP36	7
NoSplice	ZFP36L1	6
NoSplice	ZIC2	4
NoSplice	ZNF147	5
NoSplice	ZNF161	7
NoSplice	ZNF259	6
NoSplice	ZNF398	3
NoSplice	pknbeta	17
Arabidopsis	rbcL	13
NoSplice	sod1	11

5. Example 5

175. Dysregulation of the concerted action of nervous, endocrine and immune systems has been observed in several medically explained diseases, and implicated in several illnesses which are still unexplained. These medically unexplained illnesses are typically multifactorial in nature, defined only by symptoms, and have anatomic lesions which are inaccessible or have not been found (Wessely S 1999). One particularly inaccessible region is the brain, which plays a central role in the pyscho-neuroendocrine-immune (PNI) processes. Many human studies have by necessity used postmortem tissue or brain-derived cell lines, which are limited either in terms of sample availability and quality, or relevance to in vivo function. Animal models validating the molecular cross-talk between the mind and the body are more advanced than human studies, in part because brain, endocrine and immune samples can be obtained more readily, but questions remain as to their representation of human pathophyisiology. New methods for monitoring PNI communication, and the capacity of an individual to maintain healthy PNI homeostasis, would therefore be of great interest to the medical and scientific communities.

176. Peripheral blood is potentially an ideal sample for profiling PNI gene expression due to its circulation throughout the body, including leukocyte trafficking across the blood brain barrier. Even though low levels of peripheral blood

mononuclear cell (PBMC) gene expression variability have been detected, most of the variability can be attributed to individual contributions of age and sex (Campbell C 2002; Whitney AR 2003). The remarkable lack of variablilty in peripheral blood gene expression within healthy age and sex-matched populations provides an important gauge of health, and serves as a baseline for measuring peripheral blood gene expression associated with illness. There are several examples where the peripheral blood has been used to detect differential gene expression when there is no known or accessible lesion including inflammatory diseases (Heller RA 1997), neurological injury (Tang Y 2003), and chronic fatigue syndrome (Vernon 2002).

177. Herein, PNI peripheral blood gene expression was assessed by first building an annotated database of 1,622 genes known to be involved in neuroendocrine and immune pathways, then querying peripheral blood-specific databases generated from expressed sequence tag (EST) data and microarray experiments. Expression of 1,058 of the 1,622 PNI genes (65% coverage) was identified in the peripheral blood and a noteworthy number of neural and endocrine genes whose expression was unanticipated.

a) Methods & Materials

(1) PNI database:

178. A customized Microsoft Access database of genes encoding proteins that participate in biosynthetic, biochemical, and regulatory pathways of the nervous, endocrine and immune systems was generated and annotated to include gene name and Refseq abbreviation, Genbank Accession number, UniGene identification, functional information, alternate gene names, and both protein and nucleic acid sequences. The genes included in this database were selected by soliciting suggestions from molecular biologists, immunologists, endocrinologists, neurologists and psychiatrists. Published reviews covering such subjects as hypothalamic-pituitary-adrenal (HPA) axis functioning, cytokine signaling, and the complement pathways were surveyed for additional relevant genes. Both Biocarta (http://www.biocarta.com/) and Kegg (http://www.genome.ad.jp/kegg/kegg4.html) pathway databases were utilized. Redundancies were eliminated and the list extended by keyword searches of the Refseq database using words such as "immune", "hormone", "neuroendocrine", "glucocorticoid", "neurotransmitter", "T-cell", among others. Gene abbreviations were standardized to the National Center for Biotechnology Information (NCBI) RefSeq

nomenclature. Although inclusion in the list was necessarily subjective, every attempt was made to be systematic. For example, if a gene was included in the list due to known protein function, related genes (paralogs) that are less well understood were also included. Similarly, genes were included if they were shown to regulate, or be regulated by, important molecular signals. The Refseq abbreviation, UniGene number, System and Category for the complete list of genes in the PNI database, along with whether its expression was detected in the EST database, the peripheral blood microarray database or both is provided as a Table 8.

(2) Peripheral blood EST database:

A search for libraries that had been prepared from normal (non-neoplastic) human blood samples in NCBI's GenBank EST database (dbEST) (http://www.ncbi.nlm.nih.gov/dbEST/) produced nine EST libraries (see Table 6).

Table 6: The cDNA libraries used to construct the peripheral blood EST database.

Library name (UniGene Library ID)	Source	ESTs in library	Classified in UniGene	UniGene clusters represented
RA-MO-I (498)	Monocytes	6	2	2
Soares_NPBMC (6295)	Lymphocyte	2113	1951	1597
NIH_MGC_106 (6351)	Natural killer cells, cell line	6407	5928	2261
Proliferating Erythroid Cells (824)	Primary culture-Erythroid Cells	721	639	430
Homo Sapiens cDNA Library from Peripheral White Blood Cell (5009)	Peripheral White Blood Cells	3	0	0
Proliferating Human Erythroid Cells (6899)	Primary culture-Erythroid Cells	5182	4153	1624
Human Platelet (143)	Platelet	9	8	8
NIH_MGC_118 (6925)	White blood cells	10533	9397	4464
Human White blood cells (129)	White blood cells	934	905	677
RA-MO-III (238)	Monocytes	5	2	2
Human peripheral blood (242)	Whole peripheral blood	8	8	4
Red blood cell (483)	Red blood cell	65	63	4

GenBank®'s annotated EST sequences were downloaded and reformatted into an MS Access database. The entries contained 25,986 sequences, of which 23,056 could be

classified as belonging to one of 7,655 UniGene clusters. Analysis of PNI expression in this database was performed using MS Access to match UniGene ID numbers.

(3) Peripheral blood microarray database:

179. Gene expression in the peripheral blood mononuclear cells (PBMCs) of twelve individuals (six male, six female) was examined using the Human 10K A, B and C microarrays (MWG Biotech, Inc., High Point, North Carolina). These volunteers were participating in a clinical study into the causes of chronic fatigue syndrome (CFS), and eight were CFS patients while four were normal controls. Extraction of total RNA, synthesis of the biotinylated cDNA probe, hybridization to these microarrays, and detection using resonance light scattering has been described (Ojaniemi H 2003)(Ojaniemi et al, 2003). The scanned TIFF images were processed using ArrayVision™ (Imaging Research Inc., Ontario, Canada) to measure signal intensity and background for each feature. This data was extracted into an MS Access database. Datapoints which were uninformative due to technical issues were flagged and removed from subsequent analysis. A partial list of UniGene cluster IDs corresponding to specific oligos was supplied by MWG Biotech, along with Gene Ontology (GO) categories for each oligo. Of 13,074 non-redundant UniGene cluster IDs unambiguously corresponding to specific oligos, 1,281 matched to genes in PNI database. Analysis of PNI expression in PMBCs was limited to these 1,281 PNI genes in the microarray database and positive gene expression was defined as a signal-to-noise ratio greater than 2.5 in at least 75% (9 of 12) of the samples.

(4) Gene categorization:

180. Each gene in the PNI database was categorized according to its system and subcategorized by known or suspected protein function using information summarized by Genbank or Online Mendelian Inheritance in Man (OMIM, http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=OMIM) where possible where possible, or from the primary literature.

b) Results

181. A total of 1,622 non-redundant genes representing nervous (16%; 263/1622), endocrine (20%; 323/1622), and immune (38%; 618/1622) systems were identifed for inclusion in the PNI database (Table 7). Genes in the "other" category (26%; 418/1622) had well characterized roles in multiple systems, or were important because of their regulatory characteristics. The 1,622 PNI genes included

neurotransmitters, hormones, and cytokines, which are principal signaling molecules of these systems. Multiple transcriptional products representing functional regulation at the RNA level were encoded by one hundred and eighty-seven of these, distributed proportionately (±8%) to the overall distribution.

182. To determine the extent of peripheral blood PNI gene expression, both the EST and microarray databases were queried. There were 566 genes from the EST database that matched to one of the 1,622 genes in the PNI database (Table 7). Half of these genes (51%; 289/566) had immune function while smaller fractions represented neural (6%; 34/566) and endocrine functions (13%; 72/566). Of the 30,000 genes represented by oligonucleotides on the microarrays, 1,281 could be matched to genes in the annotated PNI database. There was positive hybridization to 764 of the 1,281 (60%) PNI genes (Table 7). It was confirmed that at least two out of the four samples derived from normal control volunteers showed positive hybridization for every gene reported as expressed. The proportions of genes in the neural (18%; 135/764), endocrine (19%; 145/764), immune (36%; 278/764), and "other" (27%; 206/764) categories whose peripheral blood expression was detected on microarrays was similar to these categories in PNI database.

Table 7: The categories and distribution of PNI genes in the three databases.

System	Category	PNI Database	Microarray Database	EST Database
Endocrine	Hormone Metabolism	81	33	17
	Hormone Receptor	94	43	12
	Hormones	45	22	1
	Regulated by Hormones	29	15	11
	Regulates Hormone Activity	55	20	25
	Regulates Hormone Expression	19	12	6
Immune	Apoptosis	44	17	30
	Complement Component	30	18	8
	Cytokine/Chemokine Receptors	90	44	38
	Cytokines/Chemokines	108	57	31
	Immune: MHC/HLA	22	4	20
	Other Immune Function	287	123	147
	Regulated by Cytokines	9	5	4
	Regulates Cytokine Activity	22	10	8
	T-cell Activation	6	0	3
Nervous	Amyloid processing	18	12	7
	Neurotransmitter	19	12	0
	Neurotransmitter Metabolism	33	16	10
	Neurotransmitter Receptor	101	44	3
	Other Neural Function	37	19	3

	Regulated by Neurotransmitters	2	1	1
	Regulates Neurotransmitter Activity	51	29	10
	Regulates Neurotransmitter Expression	2	2	0
Other	Circadian	7	4	4
	Growth Factor	27	13	5
	Growth Factor Receptor	13	5	2
	Heat shock	20	8	11
	Homeostasis & Small Molecule transport	37	18	6
	Other	18	10	10
	Other Neuroendocrine Function	34	20	12
	Protease Inhibitor	9	3	4
	Regulation of Cell Growth	63	28	18
	Signal Transduction	76	40	41
	Stress Response	10	4	9
	Transcription Factor	100	50	46
	Unknown Function	4	3	3
	Total	1622	764	566

183. Peripheral blood expression of several noteworthy neural and endocrine genes was detected. Sequences representing both the γ-aminobutyric acid type B ($GABA_{(B)}$) neurotransmitter receptor and γ-aminobutyric acid type A receptor-associated protein (GABARAP) were identified in the peripheral blood EST database. Microarrays detected peripheral blood expression of six GABAergic genes. Three of these belong to the GO functional grouping "GABA-A receptor activity", one in the GO group "GABA-B receptor activity" and two in the GO group "GABA\:sodium symporter activity".

184. Peripheral blood expression of many hormone receptors was detected solely in the PBMC microarray database, including progesterone receptor membrane component 2 (PGRMC2), oxytocin receptor (OXTR), prolactin receptor (PRLR), and thirty-nine other genes which are categorized in the PNI annotation as having known or probable hormone receptor activity. Thirty three genes belonging to the GO functional group "hormone activity" were found to be expressed in PBMCs including oxytocin, leptin, and proopiomelanocortin(POMC). Expression of progesterone receptor membrane component 1 (PGRMC1) was detected both in the EST database and the PBMC microarray database. Genes that modulate hormonal response, such as zinc finger protein 147 (ZNF147, also known as Efp or estrogen-responsive finger protein)

were also detected. The complete list of neural and endocrine gene expression in the peripheral blood can be found in Table 8.

c) Discussion

185. If changes in the PNI response detectable in peripheral blood can be correlated to specific physiologic states, insights could be gained about many complex diseases with suspected PNI dysregulation simply be analyzing gene expression profiles in blood. Accordingly, the possibility of peripheral blood gene expression of a comprehensive set of PNI genes was investigated.

186. Evidence for peripheral blood neurotransmitter activity was seen in both the EST and microarray databases. Microarray expression of dopaminergic receptors D1, D3, and D5 (DRD1, DRD3, DRD5) and the dopamine transporter (solute carrier family 6, member 3, abbreviated SLC6A3) was observed, in agreement with earlier findings of dopamine receptors present on lymphocytes (Amenta F 1999) and of direct activity of dopamine on T-cells (Levite M 2001). Peripheral blood expression of the beta-2- adrenergic receptor (ADRB2), a norepinephine receptor that has a well-documented role in regulating immunity (Sanders 2002), and nicotinic cholinergic receptor beta polypeptide 1 (CHRNB1), an acetylcholine receptor which was previously identified as expressed on T and B cells (Hiemke 1996; Toyabe 1997) was also confirmed.

187. The finding of GABA receptors and transporters in peripheral blood suggests the existence of a previously unstudied systemic GABAergic response. Participation of the (GABA)ergic system in immunomodulation has long been recognized (Devoino 1992), and the role of $GABA_{(A)}$ receptors in stimulating release of hypothalamic and pituitary hormones in response to cytokine activity has been well described (McCann 2000). A more direct role was suggested by the discovery of a functional $GABA_{(A)}$ receptor on the surface of T cells (Tian 1999). However, details about the role of GABAergic proteins in peripheral blood remain to be determined.

188. Of the hormone receptors found in peripheral blood, the presence of membrane-associated progesterone receptor PGRMC1 is particularly interesting. The rat homolog has been shown by differential display PCR to be expressed in the hypothalamus and to regulate female reproductive behavior (Krebs 2000). Other genes were of interest due to their potential to be induced by hormonal activity in certain tissues. One of these was ZNF147, which is up-regulated by estrogen and down-

regulated by transforming growth factor-□ (Inoue 1993; Inoue 1999). ZNF147 acts by targeting the 14-3-3sigma protein for proteolysis (Urano 2002). Since 14-3-3sigma sequesters BCL2-associated X protein (Bax) (Samuel 2001), which plays an essential role in T-cell development (Bouillet 2002), the expression of this gene in peripheral blood can represent a direct mechanism for endocrine influence on immune function. While expression of this gene was observed in fewer than 75% of the samples by microarray, and thus defined as "unexpressed", it appears to be differentially expressed depending on gender (data not shown).

189. Many of the genes in the PNI database have well-understood roles in the immune, nervous, or endocrine systems, and were categorized accordingly. Since the immunological function of PBMCs is well established, the predominance of immune system genes in the both databases was understood. However, microarray analysis of PBMCs revealed more neural and endocrine gene expression then anticipated with similar distribution of genes in each category of the PNI database as a whole. The criteria for positive hybridization on microarrays is stringent making it unlikely that expression of the genes in the neural and endocrine categories is due to noise. Importantly, many of the neuroendocrine gene expression levels were high reflecting a much larger role of the peripheral blood in PNI signaling than previously recognized and support PNI profiling of the peripheral blood to provide clues to the communication between the brain and the body.

Table 8: PNI genes and their peripheral blood expression

RefSeq Abbreviation	UniGene Cluster ID	System	Category	Evidence
AANAT	Hs.152972	Endocrine	Hormone Metabolism	
ACE	Hs.298469	Endocrine	Hormone Metabolism	Microarray
AKR1C3	Hs.78183	Endocrine	Hormone Metabolism	EST
ALDH1A1	Hs.76392	Endocrine	Hormone Metabolism	
ALDH1A2	Hs.95197	Endocrine	Hormone Metabolism	
ALDH1A3	Hs.75746	Endocrine	Hormone Metabolism	
ALDH1B1	Hs.169517	Endocrine	Hormone Metabolism	Both Databases
ALDH2	Hs.195432	Endocrine	Hormone Metabolism	Both Databases
ALDH3A2	Hs.159608	Endocrine	Hormone Metabolism	Both Databases
ALDH3B1	Hs.83155	Endocrine	Hormone Metabolism	EST
ALDH3B2	Hs.87539	Endocrine	Hormone Metabolism	
ALDH4A1	Hs.77448	Endocrine	Hormone Metabolism	EST
ALDH6A1	Hs.293970	Endocrine	Hormone Metabolism	
ALDH7A1	Hs.74294	Endocrine	Hormone Metabolism	Both Databases
ALDH8A1	Hs.18443	Endocrine	Hormone Metabolism	Microarray
ALDH9A1	Hs.2533	Endocrine	Hormone Metabolism	Both Databases
BZRP	Hs.202	Endocrine	Hormone Metabolism	Both Databases

CETP	Hs.89538	Endocrine	Hormone Metabolism	Microarray
CYP11A	Hs.76205	Endocrine	Hormone Metabolism	Microarray
CYP11B1	Hs.377912	Endocrine	Hormone Metabolism	
CYP11B2	Hs.184927	Endocrine	Hormone Metabolism	
CYP17A1	Hs.1363	Endocrine	Hormone Metabolism	Microarray
CYP19	Hs.79946	Endocrine	Hormone Metabolism	Microarray
CYP1A1	Hs.72912	Endocrine	Hormone Metabolism	Both Databases
CYP1A2	Hs.1361	Endocrine	Hormone Metabolism	
CYP1B1	Hs.154654	Endocrine	Hormone Metabolism	
CYP21A2	Hs.278430	Endocrine	Hormone Metabolism	
CYP24	Hs.89663	Endocrine	Hormone Metabolism	Microarray
CYP26A1	Hs.150595	Endocrine	Hormone Metabolism	
CYP27A1	Hs.82568	Endocrine	Hormone Metabolism	Both Databases
CYP27B1	Hs.199270	Endocrine	Hormone Metabolism	Both Databases
CYP2A13	Hs.181973	Endocrine	Hormone Metabolism	
CYP2A6	Hs.334345	Endocrine	Hormone Metabolism	
CYP2A7	Hs.250615	Endocrine	Hormone Metabolism	
CYP2B6	Hs.1360	Endocrine	Hormone Metabolism	Microarray
CYP2C18	Hs.702	Endocrine	Hormone Metabolism	
CYP2C19	Hs.198501	Endocrine	Hormone Metabolism	
CYP2C8	Hs.174220	Endocrine	Hormone Metabolism	
CYP2C9	Hs.167529	Endocrine	Hormone Metabolism	
CYP2D6	Hs.333497	Endocrine	Hormone Metabolism	Microarray
CYP2E1	Hs.75183	Endocrine	Hormone Metabolism	Microarray
CYP2F1	Hs.72913	Endocrine	Hormone Metabolism	
CYP2J2	Hs.152096	Endocrine	Hormone Metabolism	Microarray
CYP2S1	Hs.98370	Endocrine	Hormone Metabolism	EST
CYP39A1	Hs.20766	Endocrine	Hormone Metabolism	
CYP3A4	Hs.178738	Endocrine	Hormone Metabolism	
CYP3A43	Hs.306220	Endocrine	Hormone Metabolism	
CYP3A5	Hs.104117	Endocrine	Hormone Metabolism	
CYP3A7	Hs.172323	Endocrine	Hormone Metabolism	
CYP46	Hs.25121	Endocrine	Hormone Metabolism	Microarray
CYP4A11	Hs.1645	Endocrine	Hormone Metabolism	
CYP4B1	Hs.687	Endocrine	Hormone Metabolism	Microarray
CYP4F11	Hs.187393	Endocrine	Hormone Metabolism	
CYP4F12	Hs.180570	Endocrine	Hormone Metabolism	
CYP4F2	Hs.101	Endocrine	Hormone Metabolism	
CYP4F3	Hs.106242	Endocrine	Hormone Metabolism	Microarray
CYP4F8	Hs.268554	Endocrine	Hormone Metabolism	Microarray
CYP51	Hs.226213	Endocrine	Hormone Metabolism	
CYP7A1	Hs.1644	Endocrine	Hormone Metabolism	
CYP7B1	Hs.144877	Endocrine	Hormone Metabolism	
CYP8B1	Hs.35718	Endocrine	Hormone Metabolism	
DIO1	Hs.251415	Endocrine	Hormone Metabolism	Microarray
DIO2	Hs.154424	Endocrine	Hormone Metabolism	Microarray
DIO3	Hs.49322	Endocrine	Hormone Metabolism	Microarray
EDN2	Hs.1407	Endocrine	Hormone Metabolism	Microarray
GSTA3	Hs.102484	Endocrine	Hormone Metabolism	
HSD11B1	Hs.275215	Endocrine	Hormone Metabolism	

HSD11B2	Hs.1376	Endocrine	Hormone Metabolism	
HSD17B1	Hs.176901	Endocrine	Hormone Metabolism	
HSD17B3	Hs.477	Endocrine	Hormone Metabolism	Microarray
HSD17B8	Hs.423205	Endocrine	Hormone Metabolism	EST
HSD3B1	Hs.38586	Endocrine	Hormone Metabolism	
LIPE	Hs.95351	Endocrine	Hormone Metabolism	Microarray
POR	Hs.167246	Endocrine	Hormone Metabolism	EST
PTGIS	Hs.302085	Endocrine	Hormone Metabolism	
RODH	Hs.11958	Endocrine	Hormone Metabolism	Microarray
STS	Hs.79876	Endocrine	Hormone Metabolism	
SULT1A3	Hs.274614	Endocrine	Hormone Metabolism	EST
SULT2A1	Hs.81884	Endocrine	Hormone Metabolism	
TBXAS1	Hs.2001	Endocrine	Hormone Metabolism	Both Databases
TPO	Hs.2041	Endocrine	Hormone Metabolism	Microarray
ADCYAP1R1	Hs.377783	Endocrine	Hormone Receptor	
AGTRL2	Hs.433156	Endocrine	Hormone Receptor	
AMHR2	Hs.123014	Endocrine	Hormone Receptor	Microarray
AR	Hs.99915	Endocrine	Hormone Receptor	
AVPR1A	Hs.2131	Endocrine	Hormone Receptor	
AVPR1B	Hs.1372	Endocrine	Hormone Receptor	
AVPR2	Hs.2524	Endocrine	Hormone Receptor	Microarray
CCKAR	Hs.129	Endocrine	Hormone Receptor	Microarray
CNTFR	Hs.194774	Endocrine	Hormone Receptor	
CRHR1	Hs.79117	Endocrine	Hormone Receptor	
CRHR2	Hs.66578	Endocrine	Hormone Receptor	Microarray
EMR1	Hs.2375	Endocrine	Hormone Receptor	
EMR2	Hs.137354	Endocrine	Hormone Receptor	Microarray
EMR3	Hs.326777	Endocrine	Hormone Receptor	
ESR1	Hs.1657	Endocrine	Hormone Receptor	Microarray
ESR2	Hs.103504	Endocrine	Hormone Receptor	Microarray
ESRRA	Hs.110849	Endocrine	Hormone Receptor	EST
ESRRB	Hs.337489	Endocrine	Hormone Receptor	
FSHR	Hs.1428	Endocrine	Hormone Receptor	
GHRHR	Hs.767	Endocrine	Hormone Receptor	Microarray
GHSR	Hs.248115	Endocrine	Hormone Receptor	Microarray
GNRHR	Hs.73064	Endocrine	Hormone Receptor	Microarray
GNRHR2	Hs.356873	Endocrine	Hormone Receptor	
GPR14	Hs.192720	Endocrine	Hormone Receptor	Microarray
GPR24	Hs.248122	Endocrine	Hormone Receptor	Microarray
GPR31	Hs.248124	Endocrine	Hormone Receptor	
GPR38	Hs.248126	Endocrine	Hormone Receptor	Microarray
GPR39	Hs.377914	Endocrine	Hormone Receptor	
GPR48	Hs.160271	Endocrine	Hormone Receptor	
GPR49	Hs.166705	Endocrine	Hormone Receptor	
GPR50	Hs.158329	Endocrine	Hormone Receptor	
GPR51	Hs.198612	Endocrine	Hormone Receptor	Microarray
GPR57	Hs.272383	Endocrine	Hormone Receptor	
GPR58	Hs.272382	Endocrine	Hormone Receptor	
GPR66	Hs.251384	Endocrine	Hormone Receptor	Microarray
GPR81	Hs.326712	Endocrine	Hormone Receptor	

GRIN2D	Hs.113286	Endocrine	Hormone Receptor	Microarray
HSOBRGRP	Hs.23581	Endocrine	Hormone Receptor	
INSR	Hs.89695	Endocrine	Hormone Receptor	
LEC2	Hs.107054	Endocrine	Hormone Receptor	
LEPR	Hs.226627	Endocrine	Hormone Receptor	
LHCGR	Hs.1769	Endocrine	Hormone Receptor	
LOC152503	Hs.24715	Endocrine	Hormone Receptor	
MC1R	Hs.380388	Endocrine	Hormone Receptor	
MC2R	Hs.248144	Endocrine	Hormone Receptor	
MC3R	Hs.248018	Endocrine	Hormone Receptor	Microarray
MC4R	Hs.247980	Endocrine	Hormone Receptor	Microarray
MC5R	Hs.248145	Endocrine	Hormone Receptor	Microarray
MTNR1A	Hs.248147	Endocrine	Hormone Receptor	
MTNR1B	Hs.158328	Endocrine	Hormone Receptor	
NR0B1	Hs.268490	Endocrine	Hormone Receptor	Microarray
NR0B2	Hs.427055	Endocrine	Hormone Receptor	
NR1D2	Hs.37288	Endocrine	Hormone Receptor	
NR1H2	Hs.100221	Endocrine	Hormone Receptor	Both Databases
NR1H3	Hs.347353	Endocrine	Hormone Receptor	Microarray
NR1H4	Hs.171683	Endocrine	Hormone Receptor	Microarray
NR2C1	Hs.108301	Endocrine	Hormone Receptor	
NR2C2	Hs.378877	Endocrine	Hormone Receptor	
NR2E1	Hs.22591	Endocrine	Hormone Receptor	
NR2E3	Hs.187354	Endocrine	Hormone Receptor	
NR2F1	Hs.421993	Endocrine	Hormone Receptor	
NR2F2	Hs.347991	Endocrine	Hormone Receptor	
NR2F6	Hs.239752	Endocrine	Hormone Receptor	Microarray
NR3C1	Hs.75772	Endocrine	Hormone Receptor	Both Databases
NR3C2	Hs.1790	Endocrine	Hormone Receptor	
NR4A1	Hs.1119	Endocrine	Hormone Receptor	Both Databases
NR4A2	Hs.82120	Endocrine	Hormone Receptor	Both Databases
NR4A3	Hs.80561	Endocrine	Hormone Receptor	Both Databases
NR5A1	Hs.157037	Endocrine	Hormone Receptor	Microarray
NR5A2	Hs.183123	Endocrine	Hormone Receptor	
NR6A1	Hs.278599	Endocrine	Hormone Receptor	Microarray
OXTR	Hs.2820	Endocrine	Hormone Receptor	Microarray
PGR	Hs.2905	Endocrine	Hormone Receptor	
PGRMC1	Hs.90061	Endocrine	Hormone Receptor	Both Databases
PGRMC2	Hs.9071	Endocrine	Hormone Receptor	Both Databases
PHIP	Hs.10177	Endocrine	Hormone Receptor	
PRLR	Hs.1906	Endocrine	Hormone Receptor	Microarray
PTHR1	Hs.1019	Endocrine	Hormone Receptor	
PTHR2	Hs.159499	Endocrine	Hormone Receptor	Microarray
RARA	Hs.250505	Endocrine	Hormone Receptor	EST
RARB	Hs.171495	Endocrine	Hormone Receptor	Microarray
RDC1	Hs.23016	Endocrine	Hormone Receptor	
RORA	Hs.2156	Endocrine	Hormone Receptor	
RORB	Hs.198481	Endocrine	Hormone Receptor	Microarray
RORC	Hs.133314	Endocrine	Hormone Receptor	Microarray
RXRA	Hs.20084	Endocrine	Hormone Receptor	Both Databases

RXRB	Hs.79372	Endocrine	Hormone Receptor	Both Databases
SLT	Hs.333173	Endocrine	Hormone Receptor	
TACR1	Hs.1080	Endocrine	Hormone Receptor	
THRA	Hs.724	Endocrine	Hormone Receptor	Microarray
THRB	Hs.121503	Endocrine	Hormone Receptor	
TRHR	Hs.3022	Endocrine	Hormone Receptor	Microarray
TSHR	Hs.123078	Endocrine	Hormone Receptor	Microarray
VIPR1	Hs.348500	Endocrine	Hormone Receptor	EST
ADM	Hs.394	Endocrine	Hormones	EST
AMH	Hs.112432	Endocrine	Hormones	Microarray
AVP	Hs.89648	Endocrine	Hormones	Microarray
CCKBR	Hs.203	Endocrine	Hormones	Microarray
CGA	Hs.119689	Endocrine	Hormones	Microarray
CHGA	Hs.172216	Endocrine	Hormones	Microarray
CHGB	Hs.2281	Endocrine	Hormones	Microarray
CNTF	Hs.348372	Endocrine	Hormones	
CRH	Hs.75294	Endocrine	Hormones	Microarray
EPO	Hs.2303	Endocrine	Hormones	Microarray
FSHB	Hs.36975	Endocrine	Hormones	
GCG	Hs.399996	Endocrine	Hormones	
GH1	Hs.115352	Endocrine	Hormones	
GH2	Hs.378728	Endocrine	Hormones	
GHRH	Hs.37023	Endocrine	Hormones	Microarray
GNRH1	Hs.82963	Endocrine	Hormones	
GNRH2	Hs.129715	Endocrine	Hormones	Microarray
GPHA2	Hs.127223	Endocrine	Hormones	
HCRT	Hs.158348	Endocrine	Hormones	Microarray
INHA	Hs.1734	Endocrine	Hormones	
INHBA	Hs.727	Endocrine	Hormones	
INHBC	Hs.374664	Endocrine	Hormones	
INS	Hs.89832	Endocrine	Hormones	
INSL3	Hs.37062	Endocrine	Hormones	Microarray
INSL5	Hs.251380	Endocrine	Hormones	Microarray
INSL6	Hs.147467	Endocrine	Hormones	
LEP	Hs.194236	Endocrine	Hormones	Microarray
LHB	Hs.154704	Endocrine	Hormones	
OXT	Hs.113216	Endocrine	Hormones	Microarray
PMCH	Hs.2182	Endocrine	Hormones	
PMCHL1	Hs.247975	Endocrine	Hormones	
PMCHL2	Hs.381277	Endocrine	Hormones	
POMC	Hs.1897	Endocrine	Hormones	Microarray
PRL	Hs.1905	Endocrine	Hormones	Microarray
PTH	Hs.37045	Endocrine	Hormones	Microarray
PTHLH	Hs.89626	Endocrine	Hormones	Microarray
RETN	Hs.283091	Endocrine	Hormones	
RLN1	Hs.105314	Endocrine	Hormones	Microarray
RLN2	Hs.127032	Endocrine	Hormones	
RLN3	Hs.352155	Endocrine	Hormones	
SCT	Hs.302005	Endocrine	Hormones	
SPC	Hs.343668	Endocrine	Hormones	Microarray

TRH	Hs.182231	Endocrine	Hormones	Microarray
TSHB	Hs.406687	Endocrine	Hormones	
UCN	Hs.134932	Endocrine	Hormones	
AIG-1	Hs.107528	Endocrine	Regulated by Hormones	
CDK4	Hs.95577	Endocrine	Regulated by Hormones	EST
CDKN1C	Hs.106070	Endocrine	Regulated by Hormones	Microarray
E2IG2	Hs.18552	Endocrine	Regulated by Hormones	Microarray
E2IG4	Hs.8361	Endocrine	Regulated by Hormones	Microarray
E2IG5	Hs.432722	Endocrine	Regulated by Hormones	EST
EBAG9	Hs.9222	Endocrine	Regulated by Hormones	Microarray
FLJ12541	Hs.24553	Endocrine	Regulated by Hormones	Microarray
FSHPRH1	Hs.123122	Endocrine	Regulated by Hormones	Microarray
GHITM	Hs.433957	Endocrine	Regulated by Hormones	EST
GREB1	Hs.193914	Endocrine	Regulated by Hormones	Microarray
GRTP1	Hs.108118	Endocrine	Regulated by Hormones	
HK2	Hs.198427	Endocrine	Regulated by Hormones	Microarray
HSPB1	Hs.76067	Endocrine	Regulated by Hormones	Both Databases
INSIG1	Hs.56205	Endocrine	Regulated by Hormones	EST
INSIG2	Hs.7089	Endocrine	Regulated by Hormones	
LCN7	Hs.173508	Endocrine	Regulated by Hormones	
NRGN	Hs.26944	Endocrine	Regulated by Hormones	
NS	Hs.279923	Endocrine	Regulated by Hormones	EST
PIP	Hs.99949	Endocrine	Regulated by Hormones	Microarray
PSCD2	Hs.303091	Endocrine	Regulated by Hormones	EST
RARRES1	Hs.82547	Endocrine	Regulated by Hormones	Microarray
RARRES2	Hs.37682	Endocrine	Regulated by Hormones	Microarray
RARRES3	Hs.17466	Endocrine	Regulated by Hormones	EST
RASD1	Hs.25829	Endocrine	Regulated by Hormones	Both Databases
SFRS5	Hs.166975	Endocrine	Regulated by Hormones	EST
SRY	Hs.1992	Endocrine	Regulated by Hormones	Microarray
THRSP	Hs.91877	Endocrine	Regulated by Hormones	
TOMM70A	Hs.21198	Endocrine	Regulated by Hormones	Both Databases
ABCB1	Hs.21330	Endocrine	Regulates Hormone Activity	
ADRB1	Hs.99913	Endocrine	Regulates Hormone Activity	
AGRP	Hs.104633	Endocrine	Regulates Hormone Activity	
ALB	Hs.184411	Endocrine	Regulates Hormone Activity	
ASIP	Hs.361642	Endocrine	Regulates Hormone Activity	
CALR	Hs.353170	Endocrine	Regulates Hormone Activity	EST
COASTER	Hs.172329	Endocrine	Regulates Hormone Activity	EST
CREBBP	Hs.23598	Endocrine	Regulates Hormone Activity	
CRHBP	Hs.115617	Endocrine	Regulates Hormone Activity	Microarray
FKBP4	Hs.848	Endocrine	Regulates Hormone Activity	Both Databases
GMEB1	Hs.4069	Endocrine	Regulates Hormone Activity	
GNAS	Hs.374523	Endocrine	Regulates Hormone Activity	EST
GPB5	Hs.375028	Endocrine	Regulates Hormone Activity	
IDE	Hs.1508	Endocrine	Regulates Hormone Activity	EST
IRS1	Hs.96063	Endocrine	Regulates Hormone Activity	Microarray
IRS2	Hs.143648	Endocrine	Regulates Hormone Activity	
IRS4	Hs.159609	Endocrine	Regulates Hormone Activity	
MKNK2	Hs.261828	Endocrine	Regulates Hormone Activity	Both Databases

MME	Hs.1298	Endocrine	Regulates Hormone Activity	
NCOA2	Hs.432323	Endocrine	Regulates Hormone Activity	
NCOA3	Hs.225977	Endocrine	Regulates Hormone Activity	EST
NCOA4	Hs.99908	Endocrine	Regulates Hormone Activity	EST
NCOA5	Hs.288140	Endocrine	Regulates Hormone Activity	
NCOA6	Hs.159613	Endocrine	Regulates Hormone Activity	
NCOA6IP	Hs.179909	Endocrine	Regulates Hormone Activity	EST
NRBF-2	Hs.27181	Endocrine	Regulates Hormone Activity	EST
PCSK1N	Hs.429437	Endocrine	Regulates Hormone Activity	
PERC	Hs.248652	Endocrine	Regulates Hormone Activity	
PI4K2B	Hs.23920	Endocrine	Regulates Hormone Activity	Microarray
PLAC3	Hs.293896	Endocrine	Regulates Hormone Activity	Microarray
PRDM2	Hs.26719	Endocrine	Regulates Hormone Activity	EST
PTPN1	Hs.155894	Endocrine	Regulates Hormone Activity	Both Databases
RBP2	Hs.182313	Endocrine	Regulates Hormone Activity	
REA	Hs.7771	Endocrine	Regulates Hormone Activity	Both Databases
RGS19IP1	Hs.6454	Endocrine	Regulates Hormone Activity	Microarray
SHARP	Hs.184245	Endocrine	Regulates Hormone Activity	Both Databases
SHBG	Hs.46319	Endocrine	Regulates Hormone Activity	Microarray
SIGLEC6	Hs.117992	Endocrine	Regulates Hormone Activity	Microarray
SNX15	Hs.80132	Endocrine	Regulates Hormone Activity	Both Databases
SNX4	Hs.267812	Endocrine	Regulates Hormone Activity	EST
SNX6	Hs.284291	Endocrine	Regulates Hormone Activity	EST
SP110	Hs.38125	Endocrine	Regulates Hormone Activity	Both Databases
ST13	Hs.119222	Endocrine	Regulates Hormone Activity	EST
TRAP100	Hs.23106	Endocrine	Regulates Hormone Activity	Both Databases
TRAP150	Hs.108319	Endocrine	Regulates Hormone Activity	EST
TRAP240	Hs.11861	Endocrine	Regulates Hormone Activity	
TRHDE	Hs.6510	Endocrine	Regulates Hormone Activity	Microarray
TRIP10	Hs.73999	Endocrine	Regulates Hormone Activity	Microarray
TRIP11	Hs.85092	Endocrine	Regulates Hormone Activity	Both Databases
TRIP12	Hs.138617	Endocrine	Regulates Hormone Activity	EST
TRIP13	Hs.6566	Endocrine	Regulates Hormone Activity	Microarray
TRIP15	Hs.30212	Endocrine	Regulates Hormone Activity	EST
TRIP3	Hs.2210	Endocrine	Regulates Hormone Activity	
TRIP4	Hs.116784	Endocrine	Regulates Hormone Activity	Both Databases
UGT2B7	Hs.10319	Endocrine	Regulates Hormone Activity	
ENSA	Hs.111680	Endocrine	Regulates Hormone Expression	Both Databases
GALR2	Hs.158351	Endocrine	Regulates Hormone Expression	Microarray
GALR3	Hs.158353	Endocrine	Regulates Hormone Expression	
HDAC3	Hs.446552	Endocrine	Regulates Hormone Expression	
INHBB	Hs.1735	Endocrine	Regulates Hormone Expression	
IPF1	Hs.32938	Endocrine	Regulates Hormone Expression	Microarray
KLK1	Hs.123107	Endocrine	Regulates Hormone Expression	Microarray
KLK2	Hs.181350	Endocrine	Regulates Hormone Expression	Microarray
LHX3	Hs.148427	Endocrine	Regulates Hormone Expression	Microarray
NCOA1	Hs.74002	Endocrine	Regulates Hormone Expression	Both Databases
NRIP1	Hs.155017	Endocrine	Regulates Hormone Expression	EST
PC	Hs.89890	Endocrine	Regulates Hormone Expression	Microarray
PCSK1	Hs.78977	Endocrine	Regulates Hormone Expression	

PCSK2	Hs.93164	Endocrine	Regulates Hormone Expression	
PREB	Hs.279784	Endocrine	Regulates Hormone Expression	Both Databases
PRH	Hs.247710	Endocrine	Regulates Hormone Expression	Microarray
SMARCA4	Hs.78202	Endocrine	Regulates Hormone Expression	Both Databases
SNW1	Hs.79008	Endocrine	Regulates Hormone Expression	EST
SST	Hs.12409	Endocrine	Regulates Hormone Expression	Microarray
AKT1	Hs.71816	Immune	Apoptosis	Both Databases
APAF1	Hs.373575	Immune	Apoptosis	
APCS	Hs.1957	Immune	Apoptosis	Microarray
ASC	Hs.71869	Immune	Apoptosis	EST
BAK1	Hs.93213	Immune	Apoptosis	Both Databases
BAX	Hs.159428	Immune	Apoptosis	EST
BCL2	Hs.79241	Immune	Apoptosis	Both Databases
BCL2A1	Hs.227817	Immune	Apoptosis	EST
BCL2L1	Hs.305890	Immune	Apoptosis	EST
BCL2L2	Hs.75244	Immune	Apoptosis	Both Databases
BID	Hs.172894	Immune	Apoptosis	Both Databases
BTN3A1	Hs.284283	Immune	Apoptosis	EST
CARD10	Hs.57973	Immune	Apoptosis	Microarray
CASP1	Hs.2490	Immune	Apoptosis	
CASP10	Hs.5353	Immune	Apoptosis	
CASP2	Hs.108131	Immune	Apoptosis	
CASP3	Hs.74552	Immune	Apoptosis	Both Databases
CASP4	Hs.74122	Immune	Apoptosis	Both Databases
CASP5	Hs.3257	Immune	Apoptosis	Microarray
CASP6	Hs.3280	Immune	Apoptosis	
CASP7	Hs.9216	Immune	Apoptosis	
CASP8	Hs.381231	Immune	Apoptosis	EST
CASP9	Hs.100641	Immune	Apoptosis	EST
CFLAR	Hs.195175	Immune	Apoptosis	EST
DAP	Hs.75189	Immune	Apoptosis	EST
DAPK1	Hs.153924	Immune	Apoptosis	EST
EI24	Hs.343911	Immune	Apoptosis	EST
FADD	Hs.86131	Immune	Apoptosis	EST
FAF1	Hs.25821	Immune	Apoptosis	EST
GAB1	Hs.239706	Immune	Apoptosis	
ICEBERG	Hs.56279	Immune	Apoptosis	
LRDD	Hs.123136	Immune	Apoptosis	
MADD	Hs.82548	Immune	Apoptosis	Both Databases
MAGED1	Hs.177556	Immune	Apoptosis	EST
MYD88	Hs.82116	Immune	Apoptosis	Both Databases
TANK	Hs.146847	Immune	Apoptosis	Both Databases
TIAF1	Hs.75822	Immune	Apoptosis	EST
TNFSF6	Hs.2007	Immune	Apoptosis	Both Databases
TP53	Hs.1846	Immune	Apoptosis	EST
TRADD	Hs.89862	Immune	Apoptosis	Microarray
TRAF1	Hs.2134	Immune	Apoptosis	Both Databases
TRAF2	Hs.373508	Immune	Apoptosis	EST
VDAC1	Hs.149155	Immune	Apoptosis	EST
WISP1	Hs.194680	Immune	Apoptosis	Microarray

BF	Hs.69771	Immune	Complement Component	
C1QA	Hs.9641	Immune	Complement Component	
C1QB	Hs.8986	Immune	Complement Component	Microarray
C1QBP	Hs.78614	Immune	Complement Component	Both Databases
C1QR1	Hs.97199	Immune	Complement Component	Both Databases
C1R	Hs.1279	Immune	Complement Component	
C1S	Hs.169756	Immune	Complement Component	
C2	Hs.2253	Immune	Complement Component	Both Databases
C3	Hs.284394	Immune	Complement Component	Microarray
C4A	Hs.170250	Immune	Complement Component	Microarray
C4B	Hs.433721	Immune	Complement Component	
C4BPA	Hs.1012	Immune	Complement Component	Microarray
C4BPB	Hs.99886	Immune	Complement Component	Microarray
C5	Hs.1281	Immune	Complement Component	Microarray
C5R1	Hs.2161	Immune	Complement Component	Microarray
C6	Hs.1282	Immune	Complement Component	
C7	Hs.78065	Immune	Complement Component	Microarray
C8A	Hs.93210	Immune	Complement Component	Microarray
C8B	Hs.38069	Immune	Complement Component	
C8G	Hs.1285	Immune	Complement Component	
C9	Hs.1290	Immune	Complement Component	Microarray
CLU	Hs.75106	Immune	Complement Component	EST
CR1	Hs.193716	Immune	Complement Component	Microarray
CR2	Hs.73792	Immune	Complement Component	Both Databases
DF	Hs.155597	Immune	Complement Component	Both Databases
ITGAM	Hs.172631	Immune	Complement Component	EST
MASP1	Hs.356082	Immune	Complement Component	
MASP2	Hs.119983	Immune	Complement Component	Microarray
MBL2	Hs.2314	Immune	Complement Component	Microarray
RGC32	Hs.76640	Immune	Complement Component	EST
BLR1	Hs.113916	Immune	Cytokine/Chemokine Receptors	Both Databases
CCBP2	Hs.117572	Immune	Cytokine/Chemokine Receptors	Microarray
CCR1	Hs.301921	Immune	Cytokine/Chemokine Receptors	Both Databases
CCR2	Hs.395	Immune	Cytokine/Chemokine Receptors	Microarray
CCR3	Hs.158324	Immune	Cytokine/Chemokine Receptors	Both Databases
CCR4	Hs.184926	Immune	Cytokine/Chemokine Receptors	
CCR5	Hs.54443	Immune	Cytokine/Chemokine Receptors	
CCR6	Hs.46468	Immune	Cytokine/Chemokine Receptors	
CCR7	Hs.1652	Immune	Cytokine/Chemokine Receptors	Both Databases
CCR8	Hs.113222	Immune	Cytokine/Chemokine Receptors	
CCR9	Hs.225946	Immune	Cytokine/Chemokine Receptors	Microarray
CCRL1	Hs.310512	Immune	Cytokine/Chemokine Receptors	
CCRL2	Hs.302043	Immune	Cytokine/Chemokine Receptors	Microarray
CMKLR1	Hs.159553	Immune	Cytokine/Chemokine Receptors	Microarray
CRL3	Hs.351813	Immune	Cytokine/Chemokine Receptors	
CSF1R	Hs.174142	Immune	Cytokine/Chemokine Receptors	Both Databases
CSF2RA	Hs.182378	Immune	Cytokine/Chemokine Receptors	
CSF2RB	Hs.285401	Immune	Cytokine/Chemokine Receptors	
CSF3R	Hs.2175	Immune	Cytokine/Chemokine Receptors	Both Databases
CX3CR1	Hs.78913	Immune	Cytokine/Chemokine Receptors	Both Databases

CXCR3	Hs.198252	Immune	Cytokine/Chemokine Receptors	Both Databases
CXCR4	Hs.89414	Immune	Cytokine/Chemokine Receptors	Both Databases
CXCR6	Hs.34526	Immune	Cytokine/Chemokine Receptors	Microarray
FY	Hs.183	Immune	Cytokine/Chemokine Receptors	
GPR17	Hs.46453	Immune	Cytokine/Chemokine Receptors	
GPR2	Hs.278446	Immune	Cytokine/Chemokine Receptors	Microarray
GPR30	Hs.113207	Immune	Cytokine/Chemokine Receptors	
HM74	Hs.137555	Immune	Cytokine/Chemokine Receptors	Both Databases
IL10RA	Hs.327	Immune	Cytokine/Chemokine Receptors	Both Databases
IL10RB	Hs.173936	Immune	Cytokine/Chemokine Receptors	Both Databases
IL11RA	Hs.64310	Immune	Cytokine/Chemokine Receptors	Microarray
IL12RB1	Hs.121544	Immune	Cytokine/Chemokine Receptors	Both Databases
IL12RB2	Hs.73165	Immune	Cytokine/Chemokine Receptors	
IL13RA1	Hs.285115	Immune	Cytokine/Chemokine Receptors	EST
IL13RA2	Hs.25954	Immune	Cytokine/Chemokine Receptors	
IL15RA	Hs.12503	Immune	Cytokine/Chemokine Receptors	Microarray
IL17BR	Hs.5470	Immune	Cytokine/Chemokine Receptors	
IL17R	Hs.129751	Immune	Cytokine/Chemokine Receptors	
IL-17RC	Hs.129959	Immune	Cytokine/Chemokine Receptors	EST
IL-17RE	Hs.31524	Immune	Cytokine/Chemokine Receptors	
IL18R1	Hs.159301	Immune	Cytokine/Chemokine Receptors	
IL1R1	Hs.82112	Immune	Cytokine/Chemokine Receptors	Microarray
IL1R2	Hs.25333	Immune	Cytokine/Chemokine Receptors	Both Databases
IL1RL1	Hs.66	Immune	Cytokine/Chemokine Receptors	
IL1RL2	Hs.102865	Immune	Cytokine/Chemokine Receptors	
IL20RA	Hs.21814	Immune	Cytokine/Chemokine Receptors	
IL21R	Hs.210546	Immune	Cytokine/Chemokine Receptors	Microarray
IL22R	Hs.110915	Immune	Cytokine/Chemokine Receptors	
IL22RA2	Hs.126891	Immune	Cytokine/Chemokine Receptors	Microarray
IL-23R	Hs.375184	Immune	Cytokine/Chemokine Receptors	
IL28RA	Hs.386334	Immune	Cytokine/Chemokine Receptors	
IL2RA	Hs.1724	Immune	Cytokine/Chemokine Receptors	EST
IL2RB	Hs.75596	Immune	Cytokine/Chemokine Receptors	Both Databases
IL2RG	Hs.84	Immune	Cytokine/Chemokine Receptors	EST
IL3RA	Hs.172689	Immune	Cytokine/Chemokine Receptors	EST
IL4R	Hs.75545	Immune	Cytokine/Chemokine Receptors	Both Databases
IL5RA	Hs.68876	Immune	Cytokine/Chemokine Receptors	Microarray
IL6R	Hs.193400	Immune	Cytokine/Chemokine Receptors	EST
IL7R	Hs.362807	Immune	Cytokine/Chemokine Receptors	EST
IL8RA	Hs.194778	Immune	Cytokine/Chemokine Receptors	Both Databases
IL8RB	Hs.846	Immune	Cytokine/Chemokine Receptors	
IL9R	Hs.1702	Immune	Cytokine/Chemokine Receptors	
LIFR	Hs.2798	Immune	Cytokine/Chemokine Receptors	
LTBR	Hs.1116	Immune	Cytokine/Chemokine Receptors	Both Databases
NGFR	Hs.1827	Immune	Cytokine/Chemokine Receptors	Microarray
TNFRSF10A	Hs.249190	Immune	Cytokine/Chemokine Receptors	Microarray
TNFRSF10B	Hs.51233	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF10C	Hs.119684	Immune	Cytokine/Chemokine Receptors	
TNFRSF10D	Hs.129844	Immune	Cytokine/Chemokine Receptors	
TNFRSF11A	Hs.114676	Immune	Cytokine/Chemokine Receptors	

TNFRSF11B	Hs.81791	Immune	Cytokine/Chemokine Receptors	
TNFRSF13B	Hs.158341	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF13C	Hs.344088	Immune	Cytokine/Chemokine Receptors	
TNFRSF14	Hs.279899	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF17	Hs.2556	Immune	Cytokine/Chemokine Receptors	
TNFRSF18	Hs.212680	Immune	Cytokine/Chemokine Receptors	EST
TNFRSF19	Hs.283615	Immune	Cytokine/Chemokine Receptors	
TNFRSF19L	Hs.79707	Immune	Cytokine/Chemokine Receptors	EST
TNFRSF1A	Hs.159	Immune	Cytokine/Chemokine Receptors	Microarray
TNFRSF1B	Hs.256278	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF21	Hs.159651	Immune	Cytokine/Chemokine Receptors	Microarray
TNFRSF25	Hs.180338	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF4	Hs.129780	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF5	Hs.25648	Immune	Cytokine/Chemokine Receptors	Both Databases
TNFRSF6	Hs.82359	Immune	Cytokine/Chemokine Receptors	EST
TNFRSF6B	Hs.348183	Immune	Cytokine/Chemokine Receptors	Microarray
TNFRSF7	Hs.355307	Immune	Cytokine/Chemokine Receptors	EST
TNFRSF8	Hs.1314	Immune	Cytokine/Chemokine Receptors	EST
WSX1	Hs.132781	Immune	Cytokine/Chemokine Receptors	EST
XCR1	Hs.248116	Immune	Cytokine/Chemokine Receptors	Microarray
CCL1	Hs.72918	Immune	Cytokines/Chemokines	
CCL11	Hs.54460	Immune	Cytokines/Chemokines	Microarray
CCL13	Hs.11383	Immune	Cytokines/Chemokines	
CCL14	Hs.20144	Immune	Cytokines/Chemokines	Microarray
CCL15	Hs.272493	Immune	Cytokines/Chemokines	Microarray
CCL16	Hs.10458	Immune	Cytokines/Chemokines	Microarray
CCL17	Hs.66742	Immune	Cytokines/Chemokines	Microarray
CCL18	Hs.16530	Immune	Cytokines/Chemokines	Microarray
CCL19	Hs.50002	Immune	Cytokines/Chemokines	Microarray
CCL2	Hs.303649	Immune	Cytokines/Chemokines	EST
CCL20	Hs.75498	Immune	Cytokines/Chemokines	Microarray
CCL21	Hs.57907	Immune	Cytokines/Chemokines	Microarray
CCL22	Hs.97203	Immune	Cytokines/Chemokines	EST
CCL23	Hs.169191	Immune	Cytokines/Chemokines	
CCL24	Hs.247838	Immune	Cytokines/Chemokines	Microarray
CCL25	Hs.50404	Immune	Cytokines/Chemokines	Microarray
CCL26	Hs.131342	Immune	Cytokines/Chemokines	
CCL27	Hs.225948	Immune	Cytokines/Chemokines	Microarray
CCL28	Hs.283090	Immune	Cytokines/Chemokines	Microarray
CCL4	Hs.75703	Immune	Cytokines/Chemokines	Both Databases
CCL5	Hs.241392	Immune	Cytokines/Chemokines	Both Databases
CCL7	Hs.251526	Immune	Cytokines/Chemokines	
CCL8	Hs.271387	Immune	Cytokines/Chemokines	Microarray
CSF1	Hs.173894	Immune	Cytokines/Chemokines	EST
CSF2	Hs.1349	Immune	Cytokines/Chemokines	EST
CSF3	Hs.2233	Immune	Cytokines/Chemokines	Microarray
CTF1	Hs.25537	Immune	Cytokines/Chemokines	Microarray
CX3CL1	Hs.80420	Immune	Cytokines/Chemokines	Microarray
CXCL1	Hs.789	Immune	Cytokines/Chemokines	Microarray
CXCL10	Hs.2248	Immune	Cytokines/Chemokines	EST

CXCL11	Hs.103982	Immune	Cytokines/Chemokines	
CXCL12	Hs.237356	Immune	Cytokines/Chemokines	Microarray
CXCL13	Hs.100431	Immune	Cytokines/Chemokines	
CXCL14	Hs.24395	Immune	Cytokines/Chemokines	
CXCL16	Hs.82407	Immune	Cytokines/Chemokines	
CXCL2	Hs.75765	Immune	Cytokines/Chemokines	Both Databases
CXCL3	Hs.89690	Immune	Cytokines/Chemokines	Both Databases
CXCL5	Hs.89714	Immune	Cytokines/Chemokines	Microarray
CXCL6	Hs.164021	Immune	Cytokines/Chemokines	
CXCL9	Hs.77367	Immune	Cytokines/Chemokines	EST
IL10	Hs.193717	Immune	Cytokines/Chemokines	Both Databases
IL11	Hs.1721	Immune	Cytokines/Chemokines	
IL12A	Hs.673	Immune	Cytokines/Chemokines	
IL12B	Hs.674	Immune	Cytokines/Chemokines	Microarray
IL13	Hs.845	Immune	Cytokines/Chemokines	
IL14	Hs.406680	Immune	Cytokines/Chemokines	
IL15	Hs.168132	Immune	Cytokines/Chemokines	
IL16	Hs.82127	Immune	Cytokines/Chemokines	EST
IL17	Hs.41724	Immune	Cytokines/Chemokines	Microarray
IL17B	Hs.110040	Immune	Cytokines/Chemokines	Microarray
IL17C	Hs.278911	Immune	Cytokines/Chemokines	Microarray
IL17D	Hs.32450	Immune	Cytokines/Chemokines	EST
IL17E	Hs.302036	Immune	Cytokines/Chemokines	Microarray
IL17F	Hs.272295	Immune	Cytokines/Chemokines	
IL18	Hs.83077	Immune	Cytokines/Chemokines	Microarray
IL19	Hs.71979	Immune	Cytokines/Chemokines	Microarray
IL1A	Hs.1722	Immune	Cytokines/Chemokines	Microarray
IL1B	Hs.126256	Immune	Cytokines/Chemokines	Both Databases
IL1F10	Hs.306974	Immune	Cytokines/Chemokines	
IL1F5	Hs.207224	Immune	Cytokines/Chemokines	Microarray
IL1F6	Hs.278910	Immune	Cytokines/Chemokines	Microarray
IL1F7	Hs.166371	Immune	Cytokines/Chemokines	
IL1F8	Hs.278909	Immune	Cytokines/Chemokines	
IL1F9	Hs.211238	Immune	Cytokines/Chemokines	
IL2	Hs.89679	Immune	Cytokines/Chemokines	
IL20	Hs.272373	Immune	Cytokines/Chemokines	Microarray
IL21	Hs.302014	Immune	Cytokines/Chemokines	
IL22	Hs.287369	Immune	Cytokines/Chemokines	Microarray
IL23A	Hs.98309	Immune	Cytokines/Chemokines	EST
IL24	Hs.315463	Immune	Cytokines/Chemokines	Microarray
IL26	Hs.272350	Immune	Cytokines/Chemokines	Microarray
IL27w	Hs.10927	Immune	Cytokines/Chemokines	EST
IL3	Hs.694	Immune	Cytokines/Chemokines	Microarray
IL4	Hs.73917	Immune	Cytokines/Chemokines	Both Databases
IL5	Hs.2247	Immune	Cytokines/Chemokines	Microarray
IL6	Hs.93913	Immune	Cytokines/Chemokines	Microarray
IL7	Hs.72927	Immune	Cytokines/Chemokines	EST
IL8	Hs.624	Immune	Cytokines/Chemokines	EST
IL9	Hs.960	Immune	Cytokines/Chemokines	
LIF	Hs.2250	Immune	Cytokines/Chemokines	Microarray

LTA	Hs.36	Immune	Cytokines/Chemokines	Microarray
MIF	Hs.73798	Immune	Cytokines/Chemokines	EST
N-PAC	Hs.374985	Immune	Cytokines/Chemokines	
OSM	Hs.248156	Immune	Cytokines/Chemokines	Both Databases
OSMR	Hs.238648	Immune	Cytokines/Chemokines	Microarray
PF4	Hs.81564	Immune	Cytokines/Chemokines	
PLAB	Hs.296638	Immune	Cytokines/Chemokines	EST
PPBP	Hs.2164	Immune	Cytokines/Chemokines	Both Databases
SCYA3	Hs.73817	Immune	Cytokines/Chemokines	Both Databases
SCYE1	Hs.333513	Immune	Cytokines/Chemokines	EST
TNF	Hs.241570	Immune	Cytokines/Chemokines	Both Databases
TNFRSF9	Hs.73895	Immune	Cytokines/Chemokines	EST
TNFSF10	Hs.83429	Immune	Cytokines/Chemokines	
TNFSF11	Hs.115770	Immune	Cytokines/Chemokines	
TNFSF12	Hs.26401	Immune	Cytokines/Chemokines	EST
TNFSF13	Hs.54673	Immune	Cytokines/Chemokines	Both Databases
TNFSF13B	Hs.270737	Immune	Cytokines/Chemokines	Both Databases
TNFSF14	Hs.129708	Immune	Cytokines/Chemokines	Microarray
TNFSF15	Hs.241382	Immune	Cytokines/Chemokines	
TNFSF18	Hs.248197	Immune	Cytokines/Chemokines	
TNFSF4	Hs.181097	Immune	Cytokines/Chemokines	
TNFSF5	Hs.652	Immune	Cytokines/Chemokines	Microarray
TNFSF7	Hs.99899	Immune	Cytokines/Chemokines	Microarray
TNFSF8	Hs.1313	Immune	Cytokines/Chemokines	
TNFSF9	Hs.1524	Immune	Cytokines/Chemokines	Microarray
XCL1	Hs.3195	Immune	Cytokines/Chemokines	
XCL2	Hs.174228	Immune	Cytokines/Chemokines	
YARS	Hs.239307	Immune	Cytokines/Chemokines	EST
BAT1	Hs.55296	Immune	Immune: MHC/HLA	Both Databases
HLA-A	Hs.181244	Immune	Immune: MHC/HLA	EST
HLA-B	Hs.77961	Immune	Immune: MHC/HLA	EST
HLA-C	Hs.277477	Immune	Immune: MHC/HLA	EST
HLA-DNA	Hs.351874	Immune	Immune: MHC/HLA	Microarray
HLA-DPA1	Hs.914	Immune	Immune: MHC/HLA	EST
HLA-DPB1	Hs.814	Immune	Immune: MHC/HLA	EST
HLA-DQA1	Hs.198253	Immune	Immune: MHC/HLA	EST
HLA-DQB1	Hs.73931	Immune	Immune: MHC/HLA	EST
HLA-DRA	Hs.76807	Immune	Immune: MHC/HLA	EST
HLA-DRB3	Hs.308026	Immune	Immune: MHC/HLA	EST
HLA-DRB4	Hs.318720	Immune	Immune: MHC/HLA	EST
HLA-DRB5	Hs.352392	Immune	Immune: MHC/HLA	EST
HLA-E	Hs.381008	Immune	Immune: MHC/HLA	EST
LILRB4	Hs.67846	Immune	Immune: MHC/HLA	EST
MHC2TA	Hs.3076	Immune	Immune: MHC/HLA	EST
MICA	Hs.90598	Immune	Immune: MHC/HLA	EST
NSEP1	Hs.74497	Immune	Immune: MHC/HLA	EST
PSMB8	Hs.180062	Immune	Immune: MHC/HLA	Both Databases
PSMB9	Hs.381081	Immune	Immune: MHC/HLA	EST
RFXANK	Hs.296776	Immune	Immune: MHC/HLA	Both Databases
RFXAP	Hs.24422	Immune	Immune: MHC/HLA	

ABCA7	Hs.134514	Immune	Other Immune Function	
ADA	Hs.1217	Immune	Other Immune Function	EST
ADAM8	Hs.86947	Immune	Other Immune Function	Both Databases
ADAR	Hs.7957	Immune	Other Immune Function	EST
ADIR	Hs.26267	Immune	Other Immune Function	Both Databases
ADORA1	Hs.77867	Immune	Other Immune Function	Microarray
ADORA2A	Hs.1613	Immune	Other Immune Function	Microarray
AIM2	Hs.105115	Immune	Other Immune Function	EST
ALOX12B	Hs.136574	Immune	Other Immune Function	
ALOX5	Hs.89499	Immune	Other Immune Function	EST
ALOX5AP	Hs.100194	Immune	Other Immune Function	Both Databases
ANXA1	Hs.78225	Immune	Other Immune Function	EST
ANXA11	Hs.75510	Immune	Other Immune Function	EST
ANXA13	Hs.181107	Immune	Other Immune Function	
ANXA2	Hs.217493	Immune	Other Immune Function	Both Databases
ANXA3	Hs.1378	Immune	Other Immune Function	
ANXA4	Hs.77840	Immune	Other Immune Function	EST
ANXA5	Hs.300711	Immune	Other Immune Function	EST
ANXA6	Hs.118796	Immune	Other Immune Function	EST
ANXA7	Hs.386741	Immune	Other Immune Function	EST
ANXA8	Hs.87268	Immune	Other Immune Function	Microarray
APOE	Hs.169401	Immune	Other Immune Function	Microarray
B2M	Hs.48516	Immune	Other Immune Function	EST
B7H2	Hs.14155	Immune	Other Immune Function	EST
B7-H3	Hs.77873	Immune	Other Immune Function	Microarray
BSG	Hs.74631	Immune	Other Immune Function	Both Databases
BTK	Hs.159494	Immune	Other Immune Function	EST
CANX	Hs.155560	Immune	Other Immune Function	EST
CAST	Hs.359682	Immune	Other Immune Function	EST
CD19	Hs.96023	Immune	Other Immune Function	
CD1A	Hs.1309	Immune	Other Immune Function	
CD1B	Hs.1310	Immune	Other Immune Function	Microarray
CD1C	Hs.1311	Immune	Other Immune Function	
CD1D	Hs.1799	Immune	Other Immune Function	
CD1E	Hs.249217	Immune	Other Immune Function	
CD2	Hs.89476	Immune	Other Immune Function	Both Databases
CD209	Hs.278694	Immune	Other Immune Function	Microarray
CD209L	Hs.23759	Immune	Other Immune Function	Microarray
CD28	Hs.1987	Immune	Other Immune Function	Both Databases
CD34	Hs.374990	Immune	Other Immune Function	
CD38	Hs.66052	Immune	Other Immune Function	Microarray
CD3D	Hs.95327	Immune	Other Immune Function	EST
CD3E	Hs.3003	Immune	Other Immune Function	EST
CD3G	Hs.2259	Immune	Other Immune Function	
CD3Z	Hs.97087	Immune	Other Immune Function	EST
CD4	Hs.17483	Immune	Other Immune Function	
CD44	Hs.169610	Immune	Other Immune Function	EST
CD5	Hs.58685	Immune	Other Immune Function	Both Databases
CD58	Hs.75626	Immune	Other Immune Function	Microarray
CD69	Hs.82401	Immune	Other Immune Function	Both Databases

CD74	Hs.84298	Immune	Other Immune Function	Both Databases
CD80	Hs.838	Immune	Other Immune Function	
CD81	Hs.54457	Immune	Other Immune Function	EST
CD84	Hs.137548	Immune	Other Immune Function	Microarray
CD86	Hs.27954	Immune	Other Immune Function	Both Databases
CD8A	Hs.85258	Immune	Other Immune Function	EST
CD8B1	Hs.2299	Immune	Other Immune Function	EST
CDR2	Hs.75124	Immune	Other Immune Function	EST
CIAS1	Hs.159483	Immune	Other Immune Function	Microarray
CLC	Hs.132004	Immune	Other Immune Function	Both Databases
CML66	Hs.195870	Immune	Other Immune Function	
CNIH	Hs.201673	Immune	Other Immune Function	Microarray
CTLA4	Hs.247824	Immune	Other Immune Function	Both Databases
CTSB	Hs.297939	Immune	Other Immune Function	Microarray
CTSC	Hs.10029	Immune	Other Immune Function	EST
CTSD	Hs.343475	Immune	Other Immune Function	Both Databases
CTSW	Hs.87450	Immune	Other Immune Function	Both Databases
CYSLTR1	Hs.124401	Immune	Other Immune Function	
CYSLTR2	Hs.253706	Immune	Other Immune Function	
DCNP1	Hs.143271	Immune	Other Immune Function	
DEFA4	Hs.2582	Immune	Other Immune Function	
EAF1	Hs.350352	Immune	Other Immune Function	
EAT2	Hs.350581	Immune	Other Immune Function	EST
EBI3	Hs.185705	Immune	Other Immune Function	
ED1	Hs.105407	Immune	Other Immune Function	Microarray
FCER1A	Hs.897	Immune	Other Immune Function	
FCER1G	Hs.433300	Immune	Other Immune Function	EST
FCER2	Hs.1416	Immune	Other Immune Function	Both Databases
FCGBP	Hs.111732	Immune	Other Immune Function	Microarray
FCGR1A	Hs.77424	Immune	Other Immune Function	EST
FCGR2A	Hs.78864	Immune	Other Immune Function	Microarray
FCGR2B	Hs.278443	Immune	Other Immune Function	Both Databases
FCGR3A	Hs.176663	Immune	Other Immune Function	EST
FCGR3B	Hs.372679	Immune	Other Immune Function	
FCGRT	Hs.111903	Immune	Other Immune Function	Both Databases
FETUB	Hs.81073	Immune	Other Immune Function	Microarray
FKBP1A	Hs.374638	Immune	Other Immune Function	
FKBP1B	Hs.77643	Immune	Other Immune Function	
FKBP2	Hs.227729	Immune	Other Immune Function	
FKBP3	Hs.379557	Immune	Other Immune Function	
FKBP5	Hs.7557	Immune	Other Immune Function	Both Databases
FKBP6	Hs.150490	Immune	Other Immune Function	
FKBP8	Hs.173464	Immune	Other Immune Function	EST
FPR1	Hs.753	Immune	Other Immune Function	EST
FUS	Hs.99969	Immune	Other Immune Function	Both Databases
G1P2	Hs.432233	Immune	Other Immune Function	EST
G1P3	Hs.265827	Immune	Other Immune Function	Both Databases
GBP1	Hs.62661	Immune	Other Immune Function	EST
GBP4	Hs.240849	Immune	Other Immune Function	EST
GBP5	Hs.237809	Immune	Other Immune Function	EST

GGTLA1	Hs.1675	Immune	Other Immune Function	Microarray
GPS2	Hs.438219	Immune	Other Immune Function	
GZMB	Hs.1051	Immune	Other Immune Function	Both Databases
GZMM	Hs.268531	Immune	Other Immune Function	Microarray
HAL	Hs.276590	Immune	Other Immune Function	
HAVCR2	Hs.155111	Immune	Other Immune Function	EST
HDC	Hs.1481	Immune	Other Immune Function	Microarray
HLA-DRB1	Hs.375570	Immune	Other Immune Function	EST
HLALS	Hs.101840	Immune	Other Immune Function	Microarray
HRH1	Hs.1570	Immune	Other Immune Function	
HRH2	Hs.247885	Immune	Other Immune Function	Microarray
HRH4	Hs.287388	Immune	Other Immune Function	
IAN4L1	Hs.26194	Immune	Other Immune Function	EST
ICAM1	Hs.168383	Immune	Other Immune Function	Both Databases
ICAM2	Hs.433303	Immune	Other Immune Function	EST
ICAM3	Hs.99995	Immune	Other Immune Function	Both Databases
ICAM4	Hs.108287	Immune	Other Immune Function	Microarray
ICAM5	Hs.151250	Immune	Other Immune Function	Microarray
ICOS	Hs.56247	Immune	Other Immune Function	EST
IFI16	Hs.155530	Immune	Other Immune Function	EST
IFI27	Hs.278613	Immune	Other Immune Function	Both Databases
IFI30	Hs.14623	Immune	Other Immune Function	EST
IFI35	Hs.50842	Immune	Other Immune Function	EST
IFI44	Hs.82316	Immune	Other Immune Function	Microarray
IFIT1	Hs.20315	Immune	Other Immune Function	Microarray
IFIT2	Hs.169274	Immune	Other Immune Function	
IFIT4	Hs.181874	Immune	Other Immune Function	Both Databases
IFITM1	Hs.366	Immune	Other Immune Function	EST
IFITM2	Hs.174195	Immune	Other Immune Function	EST
IFITM3	Hs.433414	Immune	Other Immune Function	EST
IFNA1	Hs.37026	Immune	Other Immune Function	
IFNA10	Hs.282275	Immune	Other Immune Function	
IFNA14	Hs.93907	Immune	Other Immune Function	
IFNA16	Hs.56303	Immune	Other Immune Function	
IFNA17	Hs.282276	Immune	Other Immune Function	
IFNA2	Hs.211575	Immune	Other Immune Function	
IFNA21	Hs.113211	Immune	Other Immune Function	
IFNA4	Hs.1510	Immune	Other Immune Function	
IFNA5	Hs.37113	Immune	Other Immune Function	
IFNA6	Hs.247933	Immune	Other Immune Function	
IFNA7	Hs.282274	Immune	Other Immune Function	
IFNA8	Hs.73890	Immune	Other Immune Function	Microarray
IFNAR1	Hs.1513	Immune	Other Immune Function	
IFNAR2	Hs.86958	Immune	Other Immune Function	EST
IFNB1	Hs.93177	Immune	Other Immune Function	
IFNG	Hs.856	Immune	Other Immune Function	Both Databases
IFNGR1	Hs.180866	Immune	Other Immune Function	EST
IFNGR2	Hs.177559	Immune	Other Immune Function	EST
IFNK	Hs.283810	Immune	Other Immune Function	
IFNW1	Hs.73010	Immune	Other Immune Function	Microarray

IFRD1	Hs.7879	Immune	Other Immune Function	Microarray
IFRD2	Hs.315177	Immune	Other Immune Function	Both Databases
IKBKAP	Hs.31323	Immune	Other Immune Function	Microarray
IKBKB	Hs.226573	Immune	Other Immune Function	EST
IKBKE	Hs.321045	Immune	Other Immune Function	Microarray
IKBKG	Hs.43505	Immune	Other Immune Function	Both Databases
INDO	Hs.840	Immune	Other Immune Function	
IRF4	Hs.82132	Immune	Other Immune Function	EST
ITGA1	Hs.116774	Immune	Other Immune Function	
ITGA2	Hs.271986	Immune	Other Immune Function	Both Databases
ITGA3	Hs.265829	Immune	Other Immune Function	Both Databases
ITGA4	Hs.40034	Immune	Other Immune Function	EST
ITGA5	Hs.149609	Immune	Other Immune Function	EST
ITGA6	Hs.227730	Immune	Other Immune Function	
ITGAL	Hs.174103	Immune	Other Immune Function	Both Databases
ITGAX	Hs.51077	Immune	Other Immune Function	EST
JAM2	Hs.54650	Immune	Other Immune Function	
JIK	Hs.12040	Immune	Other Immune Function	Microarray
KIR2DS2	Hs.74134	Immune	Other Immune Function	EST
KLRB1	Hs.169824	Immune	Other Immune Function	EST
KLRD1	Hs.41682	Immune	Other Immune Function	EST
KPNB2	Hs.168075	Immune	Other Immune Function	EST
LAIR1	Hs.115808	Immune	Other Immune Function	EST
LAIR2	Hs.43803	Immune	Other Immune Function	
LAT	Hs.83496	Immune	Other Immune Function	Both Databases
LBP	Hs.154078	Immune	Other Immune Function	Microarray
LCP1	Hs.381099	Immune	Other Immune Function	EST
LGALS3BP	Hs.79339	Immune	Other Immune Function	Both Databases
LOC284057	Hs.380993	Immune	Other Immune Function	
LRBA	Hs.62354	Immune	Other Immune Function	
LST1	Hs.380427	Immune	Other Immune Function	EST
LTA4H	Hs.81118	Immune	Other Immune Function	Microarray
LTB	Hs.890	Immune	Other Immune Function	Both Databases
LTB4R	Hs.28408	Immune	Other Immune Function	Both Databases
LTB4R2	Hs.130685	Immune	Other Immune Function	Both Databases
LTC4S	Hs.456	Immune	Other Immune Function	Microarray
MBP	Hs.69547	Immune	Other Immune Function	EST
MD-2	Hs.69328	Immune	Other Immune Function	
MGST2	Hs.81874	Immune	Other Immune Function	Microarray
MGST3	Hs.111811	Immune	Other Immune Function	EST
MICB	Hs.211580	Immune	Other Immune Function	EST
MIG-6	Hs.11169	Immune	Other Immune Function	Microarray
MMP1	Hs.83169	Immune	Other Immune Function	
MMP2	Hs.111301	Immune	Other Immune Function	Microarray
MMP25	Hs.198265	Immune	Other Immune Function	
MMP3	Hs.83326	Immune	Other Immune Function	
MMP8	Hs.73862	Immune	Other Immune Function	
MMP9	Hs.151738	Immune	Other Immune Function	Microarray
MPL	Hs.84171	Immune	Other Immune Function	Microarray
MST1R	Hs.2942	Immune	Other Immune Function	Microarray

MX1	Hs.76391	Immune	Other Immune Function	Both Databases
MX2	Hs.926	Immune	Other Immune Function	
NCAM1	Hs.167988	Immune	Other Immune Function	Both Databases
NCR3	Hs.88411	Immune	Other Immune Function	EST
NFATC1	Hs.96149	Immune	Other Immune Function	Microarray
NFIL3	Hs.79334	Immune	Other Immune Function	Microarray
NP	Hs.75514	Immune	Other Immune Function	EST
NYREN18	Hs.279780	Immune	Other Immune Function	EST
OAS1	Hs.442936	Immune	Other Immune Function	
OAS2	Hs.414332	Immune	Other Immune Function	
PADI5	Hs.117232	Immune	Other Immune Function	Both Databases
PAK1	Hs.64056	Immune	Other Immune Function	EST
PECAM1	Hs.78146	Immune	Other Immune Function	EST
PGDS	Hs.128433	Immune	Other Immune Function	Microarray
PIGR	Hs.205126	Immune	Other Immune Function	
PIK3CG	Hs.32942	Immune	Other Immune Function	Both Databases
PILR(ALPHA)	Hs.122591	Immune	Other Immune Function	Both Databases
PILR(BETA)	Hs.349256	Immune	Other Immune Function	Both Databases
PLA2G2E	Hs.272372	Immune	Other Immune Function	Microarray
PLA2G4A	Hs.211587	Immune	Other Immune Function	
PLA2G6	Hs.120360	Immune	Other Immune Function	
PLA2R1	Hs.171945	Immune	Other Immune Function	
PPARD	Hs.106415	Immune	Other Immune Function	Both Databases
PPIA	Hs.401787	Immune	Other Immune Function	EST
PRKRIR	Hs.177574	Immune	Other Immune Function	
PRV1	Hs.232165	Immune	Other Immune Function	Microarray
PTCRA	Hs.169002	Immune	Other Immune Function	Microarray
PTGDR	Hs.158326	Immune	Other Immune Function	
PTGDS	Hs.8272	Immune	Other Immune Function	EST
PTGER1	Hs.159360	Immune	Other Immune Function	Microarray
PTGER2	Hs.2090	Immune	Other Immune Function	Microarray
PTGER3	Hs.170917	Immune	Other Immune Function	
PTGER4	Hs.199248	Immune	Other Immune Function	
PTGES	Hs.146688	Immune	Other Immune Function	
PTGES2	Hs.288102	Immune	Other Immune Function	Both Databases
PTGFR	Hs.89418	Immune	Other Immune Function	Microarray
PTGIR	Hs.393	Immune	Other Immune Function	EST
PTGS1	Hs.88474	Immune	Other Immune Function	Both Databases
PTGS2	Hs.196384	Immune	Other Immune Function	Both Databases
PTPN22	Hs.87860	Immune	Other Immune Function	Microarray
PTPN7	Hs.35	Immune	Other Immune Function	EST
PTPN9	Hs.147663	Immune	Other Immune Function	EST
PTPRC	Hs.170121	Immune	Other Immune Function	Both Databases
PTPRK	Hs.79005	Immune	Other Immune Function	
RAG1	Hs.73958	Immune	Other Immune Function	Both Databases
RAG2	Hs.159376	Immune	Other Immune Function	
RAI	Hs.324051	Immune	Other Immune Function	Microarray
RelA	Hs.75569	Immune	Other Immune Function	EST
RELB	Hs.858	Immune	Other Immune Function	Both Databases
RFC1	Hs.166563	Immune	Other Immune Function	EST

RI58	Hs.27610	Immune	Other Immune Function	
RNASE3	Hs.73839	Immune	Other Immune Function	Microarray
SAMHD1	Hs.23889	Immune	Other Immune Function	Both Databases
SECTM1	Hs.95655	Immune	Other Immune Function	EST
SELE	Hs.89546	Immune	Other Immune Function	
SELL	Hs.82848	Immune	Other Immune Function	Both Databases
SELPLG	Hs.79283	Immune	Other Immune Function	EST
SEMA4D	Hs.79089	Immune	Other Immune Function	EST
SIGLEC5	Hs.117005	Immune	Other Immune Function	Both Databases
SLAM	Hs.32970	Immune	Other Immune Function	EST
SLC21A2	Hs.83974	Immune	Other Immune Function	Microarray
SLPI	Hs.251754	Immune	Other Immune Function	Microarray
SPAP1	Hs.194976	Immune	Other Immune Function	
SPN	Hs.80738	Immune	Other Immune Function	Both Databases
SYK	Hs.74101	Immune	Other Immune Function	Both Databases
TA-NFKBH	Hs.60088	Immune	Other Immune Function	EST
TBK1	Hs.21712	Immune	Other Immune Function	EST
TCIRG1	Hs.46465	Immune	Other Immune Function	Both Databases
THPO	Hs.1166	Immune	Other Immune Function	Microarray
TIMP2	Hs.6441	Immune	Other Immune Function	
TIMP3	Hs.245188	Immune	Other Immune Function	Microarray
TIMP4	Hs.190787	Immune	Other Immune Function	
TLR1	Hs.2474	Immune	Other Immune Function	
TLR10	Hs.120551	Immune	Other Immune Function	Microarray
TLR2	Hs.63668	Immune	Other Immune Function	Both Databases
TLR3	Hs.29499	Immune	Other Immune Function	
TMSB4X	Hs.75968	Immune	Other Immune Function	Both Databases
TOLLIP	Hs.25413	Immune	Other Immune Function	Both Databases
TPT1	Hs.401448	Immune	Other Immune Function	EST
TRAF3	Hs.297660	Immune	Other Immune Function	EST
TRIM	Hs.138701	Immune	Other Immune Function	EST
TRIP	Hs.21254	Immune	Other Immune Function	Both Databases
TYROBP	Hs.9963	Immune	Other Immune Function	Both Databases
VDR	Hs.2062	Immune	Other Immune Function	Microarray
WAS	Hs.2157	Immune	Other Immune Function	Both Databases
WASF1	Hs.75850	Immune	Other Immune Function	Microarray
ZAP-70	Hs.234569	Immune	Other Immune Function	EST
AIF1	Hs.76364	Immune	Regulated by Cytokines	Microarray
CARP	Hs.355934	Immune	Regulated by Cytokines	EST
CISH	Hs.8257	Immune	Regulated by Cytokines	Both Databases
GBP2	Hs.171862	Immune	Regulated by Cytokines	Both Databases
IL4I1	Hs.380444	Immune	Regulated by Cytokines	
NOS2A	Hs.193788	Immune	Regulated by Cytokines	Microarray
PDCD4	Hs.326248	Immune	Regulated by Cytokines	EST
PTX3	Hs.2050	Immune	Regulated by Cytokines	Microarray
VCAM1	Hs.109225	Immune	Regulated by Cytokines	
ATRN	Hs.194019	Immune	Regulates Cytokine Activity	
BRE	Hs.80426	Immune	Regulates Cytokine Activity	EST
CHUK	Hs.198998	Immune	Regulates Cytokine Activity	EST
CLEC2	Hs.114231	Immune	Regulates Cytokine Activity	Microarray

CRP	Hs.76452	Immune	Regulates Cytokine Activity	Microarray
IL18BP	Hs.325978	Immune	Regulates Cytokine Activity	EST
IL18RAP	Hs.158315	Immune	Regulates Cytokine Activity	
IL1RAP	Hs.173880	Immune	Regulates Cytokine Activity	EST
IL1RAPL1	Hs.241385	Immune	Regulates Cytokine Activity	Microarray
IL1RAPL2	Hs.272354	Immune	Regulates Cytokine Activity	Microarray
IL1RN	Hs.81134	Immune	Regulates Cytokine Activity	EST
LOC134728	Hs.158465	Immune	Regulates Cytokine Activity	
PACE4	Hs.170414	Immune	Regulates Cytokine Activity	
SOCS1	Hs.50640	Immune	Regulates Cytokine Activity	Microarray
SOCS2	Hs.405946	Immune	Regulates Cytokine Activity	EST
SOCS3	Hs.345728	Immune	Regulates Cytokine Activity	Both Databases
TLR4	Hs.159239	Immune	Regulates Cytokine Activity	Both Databases
TLR5	Hs.114408	Immune	Regulates Cytokine Activity	
TLR6	Hs.227105	Immune	Regulates Cytokine Activity	
TLR7	Hs.179152	Immune	Regulates Cytokine Activity	Microarray
TLR8	Hs.272410	Immune	Regulates Cytokine Activity	Microarray
TLR9	Hs.87968	Immune	Regulates Cytokine Activity	Microarray
CAMLG	Hs.13572	Immune	T-cell Activation	
DPP4	Hs.44926	Immune	T-cell Activation	
DPP8	Hs.44033	Immune	T-cell Activation	
DUSP14	Hs.91448	Immune	T-cell Activation	EST
LCP2	Hs.2488	Immune	T-cell Activation	EST
SPP1	Hs.313	Immune	T-cell Activation	EST
AGER	Hs.184	Neuronal	Amyloid functioning	Microarray
APBA1	Hs.4880	Neuronal	Amyloid functioning	Microarray
APBA2	Hs.26468	Neuronal	Amyloid functioning	EST
APBA3	Hs.17528	Neuronal	Amyloid functioning	Both Databases
APLP1	Hs.74565	Neuronal	Amyloid functioning	
APOC2	Hs.75615	Neuronal	Amyloid functioning	
APP	Hs.177486	Neuronal	Amyloid functioning	Microarray
BACE	Hs.49349	Neuronal	Amyloid functioning	Microarray
BACE2	Hs.271411	Neuronal	Amyloid functioning	Microarray
ITM2B	Hs.239625	Neuronal	Amyloid functioning	Both Databases
NCSTN	Hs.4788	Neuronal	Amyloid functioning	EST
PSEN1	Hs.3260	Neuronal	Amyloid functioning	Microarray
PTMA	Hs.250655	Neuronal	Amyloid functioning	EST
SAA2	Hs.336462	Neuronal	Amyloid functioning	
SEMA4C	Hs.7188	Neuronal	Amyloid functioning	Both Databases
SHC1	Hs.81972	Neuronal	Amyloid functioning	Both Databases
SHC3	Hs.151123	Neuronal	Amyloid functioning	Microarray
VSNL1	Hs.2288	Neuronal	Amyloid functioning	Microarray
ADCYAP1	Hs.68137	Neuronal	Neurotransmitter	Microarray
CALCRL	Hs.152175	Neuronal	Neurotransmitter	Microarray
CBLN1	Hs.662	Neuronal	Neurotransmitter	Microarray
KNG	Hs.77741	Neuronal	Neurotransmitter	
MAOB	Hs.82163	Neuronal	Neurotransmitter	Microarray
NPB	Hs.345721	Neuronal	Neurotransmitter	
NPFF	Hs.104555	Neuronal	Neurotransmitter	Microarray
NPPA	Hs.75640	Neuronal	Neurotransmitter	

NPPB	Hs.219140	Neuronal	Neurotransmitter	Microarray
NPPC	Hs.247916	Neuronal	Neurotransmitter	Microarray
NPY	Hs.1832	Neuronal	Neurotransmitter	Microarray
NTS	Hs.80962	Neuronal	Neurotransmitter	
NXPH1	Hs.343660	Neuronal	Neurotransmitter	
PENK	Hs.93557	Neuronal	Neurotransmitter	Microarray
PNOC	Hs.89040	Neuronal	Neurotransmitter	
PPYR1	Hs.54426	Neuronal	Neurotransmitter	Microarray
RFRP	Hs.60473	Neuronal	Neurotransmitter	Microarray
TAC1	Hs.2563	Neuronal	Neurotransmitter	Microarray
TAC3	Hs.9730	Neuronal	Neurotransmitter	
ABAT	Hs.1588	Neuronal	Neurotransmitter Metabolism	
ACHE	Hs.154495	Neuronal	Neurotransmitter Metabolism	
ALDH3A1	Hs.575	Neuronal	Neurotransmitter Metabolism	Microarray
ALDH5A1	Hs.5299	Neuronal	Neurotransmitter Metabolism	
BBOX1	Hs.9667	Neuronal	Neurotransmitter Metabolism	
CHAT	Hs.302002	Neuronal	Neurotransmitter Metabolism	Microarray
COMT	Hs.240013	Neuronal	Neurotransmitter Metabolism	EST
CPE	Hs.75360	Neuronal	Neurotransmitter Metabolism	
CPT1C	Hs.112195	Neuronal	Neurotransmitter Metabolism	
CPT2	Hs.274336	Neuronal	Neurotransmitter Metabolism	Microarray
CRAT	Hs.12068	Neuronal	Neurotransmitter Metabolism	Both Databases
CROT	Hs.12743	Neuronal	Neurotransmitter Metabolism	Microarray
CST	Hs.17958	Neuronal	Neurotransmitter Metabolism	Microarray
DBH	Hs.2301	Neuronal	Neurotransmitter Metabolism	
DDC	Hs.150403	Neuronal	Neurotransmitter Metabolism	
DMGDH	Hs.122613	Neuronal	Neurotransmitter Metabolism	
GAD1	Hs.324784	Neuronal	Neurotransmitter Metabolism	Microarray
GAD2	Hs.170808	Neuronal	Neurotransmitter Metabolism	
HMOX1	Hs.202833	Neuronal	Neurotransmitter Metabolism	Both Databases
HMOX2	Hs.284279	Neuronal	Neurotransmitter Metabolism	Both Databases
LNPEP	Hs.166733	Neuronal	Neurotransmitter Metabolism	EST
MAOA	Hs.183109	Neuronal	Neurotransmitter Metabolism	Microarray
NAALAD2	Hs.199292	Neuronal	Neurotransmitter Metabolism	
NOS1	Hs.46752	Neuronal	Neurotransmitter Metabolism	Microarray
NOS3	Hs.166373	Neuronal	Neurotransmitter Metabolism	Microarray
NOSIP	Hs.7236	Neuronal	Neurotransmitter Metabolism	Both Databases
OAT	Hs.75485	Neuronal	Neurotransmitter Metabolism	Both Databases
ODC1	Hs.75212	Neuronal	Neurotransmitter Metabolism	Both Databases
PNMT	Hs.1892	Neuronal	Neurotransmitter Metabolism	Microarray
RNPEPL1	Hs.5345	Neuronal	Neurotransmitter Metabolism	EST
TDO2	Hs.183671	Neuronal	Neurotransmitter Metabolism	EST
TH	Hs.178237	Neuronal	Neurotransmitter Metabolism	
TPH	Hs.129056	Neuronal	Neurotransmitter Metabolism	
ADMR	Hs.16743	Neuronal	Neurotransmitter Receptor	Microarray
ADRA1A	Hs.52931	Neuronal	Neurotransmitter Receptor	Microarray
ADRA1B	Hs.123055	Neuronal	Neurotransmitter Receptor	Microarray
ADRA1D	Hs.557	Neuronal	Neurotransmitter Receptor	Microarray
ADRA2B	Hs.247686	Neuronal	Neurotransmitter Receptor	
ADRB2	Hs.2551	Neuronal	Neurotransmitter Receptor	EST

BDKRB1	Hs.46348	Neuronal	Neurotransmitter Receptor	
BDKRB2	Hs.250882	Neuronal	Neurotransmitter Receptor	Microarray
BRS3	Hs.121484	Neuronal	Neurotransmitter Receptor	
CHRM1	Hs.247917	Neuronal	Neurotransmitter Receptor	Microarray
CHRM2	Hs.248099	Neuronal	Neurotransmitter Receptor	
CHRM3	Hs.7138	Neuronal	Neurotransmitter Receptor	Microarray
CHRM4	Hs.248100	Neuronal	Neurotransmitter Receptor	Microarray
CHRM5	Hs.247920	Neuronal	Neurotransmitter Receptor	Microarray
CHRNA1	Hs.2266	Neuronal	Neurotransmitter Receptor	
CHRNA10	Hs.157714	Neuronal	Neurotransmitter Receptor	Microarray
CHRNA2	Hs.57718	Neuronal	Neurotransmitter Receptor	
CHRNA3	Hs.89605	Neuronal	Neurotransmitter Receptor	
CHRNA4	Hs.10734	Neuronal	Neurotransmitter Receptor	
CHRNA5	Hs.1614	Neuronal	Neurotransmitter Receptor	Microarray
CHRNA6	Hs.103128	Neuronal	Neurotransmitter Receptor	
CHRNA7	Hs.2540	Neuronal	Neurotransmitter Receptor	
CHRNA9	Hs.272278	Neuronal	Neurotransmitter Receptor	
CHRNB1	Hs.89739	Neuronal	Neurotransmitter Receptor	Both Databases
CHRNB2	Hs.2306	Neuronal	Neurotransmitter Receptor	Microarray
CHRNB3	Hs.96094	Neuronal	Neurotransmitter Receptor	
CHRNB4	Hs.54397	Neuronal	Neurotransmitter Receptor	Microarray
CHRND	Hs.99975	Neuronal	Neurotransmitter Receptor	Microarray
CHRNE	Hs.313227	Neuronal	Neurotransmitter Receptor	
CHRNG	Hs.248101	Neuronal	Neurotransmitter Receptor	
CNR2	Hs.73037	Neuronal	Neurotransmitter Receptor	
CYB561	Hs.355264	Neuronal	Neurotransmitter Receptor	
DRD1	Hs.2624	Neuronal	Neurotransmitter Receptor	Microarray
DRD2	Hs.73893	Neuronal	Neurotransmitter Receptor	Microarray
DRD3	Hs.121478	Neuronal	Neurotransmitter Receptor	Microarray
DRD4	Hs.99922	Neuronal	Neurotransmitter Receptor	
DRD5	Hs.380681	Neuronal	Neurotransmitter Receptor	
GABBR1	Hs.167017	Neuronal	Neurotransmitter Receptor	Both Databases
GABRA1	Hs.45740	Neuronal	Neurotransmitter Receptor	
GABRA2	Hs.91343	Neuronal	Neurotransmitter Receptor	Microarray
GABRA3	Hs.123024	Neuronal	Neurotransmitter Receptor	
GABRA4	Hs.248112	Neuronal	Neurotransmitter Receptor	
GABRA5	Hs.24969	Neuronal	Neurotransmitter Receptor	
GABRA6	Hs.90791	Neuronal	Neurotransmitter Receptor	
GABRB1	Hs.89768	Neuronal	Neurotransmitter Receptor	
GABRB3	Hs.1440	Neuronal	Neurotransmitter Receptor	
GABRD	Hs.113882	Neuronal	Neurotransmitter Receptor	Microarray
GABRE	Hs.22785	Neuronal	Neurotransmitter Receptor	Microarray
GABRG2	Hs.7195	Neuronal	Neurotransmitter Receptor	
GABRG3	Hs.104133	Neuronal	Neurotransmitter Receptor	
GABRP	Hs.70725	Neuronal	Neurotransmitter Receptor	Microarray
GABRQ	Hs.283081	Neuronal	Neurotransmitter Receptor	
GABRR1	Hs.1438	Neuronal	Neurotransmitter Receptor	
GABRR2	Hs.99927	Neuronal	Neurotransmitter Receptor	Microarray
GALR1	Hs.272191	Neuronal	Neurotransmitter Receptor	
GLRA1	Hs.121490	Neuronal	Neurotransmitter Receptor	

GPR10	Hs.248119	Neuronal	Neurotransmitter Receptor	Microarray
GRIA1	Hs.319467	Neuronal	Neurotransmitter Receptor	
GRIA2	Hs.89582	Neuronal	Neurotransmitter Receptor	
GRIA3	Hs.100014	Neuronal	Neurotransmitter Receptor	Microarray
GRIA4	Hs.163697	Neuronal	Neurotransmitter Receptor	
GRID2	Hs.248130	Neuronal	Neurotransmitter Receptor	Microarray
GRM1	Hs.32945	Neuronal	Neurotransmitter Receptor	Microarray
GRM2	Hs.121510	Neuronal	Neurotransmitter Receptor	
GRM3	Hs.3786	Neuronal	Neurotransmitter Receptor	
GRM4	Hs.178078	Neuronal	Neurotransmitter Receptor	
GRM5	Hs.167185	Neuronal	Neurotransmitter Receptor	Microarray
GRM6	Hs.248131	Neuronal	Neurotransmitter Receptor	Microarray
GRM7	Hs.83407	Neuronal	Neurotransmitter Receptor	
GRM8	Hs.86204	Neuronal	Neurotransmitter Receptor	
GRPR	Hs.73883	Neuronal	Neurotransmitter Receptor	Microarray
HCRTR1	Hs.150968	Neuronal	Neurotransmitter Receptor	
HCRTR2	Hs.151624	Neuronal	Neurotransmitter Receptor	Microarray
HTR1A	Hs.247940	Neuronal	Neurotransmitter Receptor	
HTR1B	Hs.123016	Neuronal	Neurotransmitter Receptor	
HTR1D	Hs.121482	Neuronal	Neurotransmitter Receptor	
HTR1E	Hs.1611	Neuronal	Neurotransmitter Receptor	
HTR1F	Hs.248136	Neuronal	Neurotransmitter Receptor	Microarray
HTR2A	Hs.298623	Neuronal	Neurotransmitter Receptor	Microarray
HTR2B	Hs.2507	Neuronal	Neurotransmitter Receptor	Microarray
HTR2C	Hs.46362	Neuronal	Neurotransmitter Receptor	Microarray
HTR3A	Hs.2142	Neuronal	Neurotransmitter Receptor	
HTR3B	Hs.241377	Neuronal	Neurotransmitter Receptor	Microarray
HTR3C	Hs.352185	Neuronal	Neurotransmitter Receptor	
HTR4	Hs.113262	Neuronal	Neurotransmitter Receptor	Microarray
HTR5A	Hs.248137	Neuronal	Neurotransmitter Receptor	
HTR6	Hs.22180	Neuronal	Neurotransmitter Receptor	Microarray
HTR7	Hs.73739	Neuronal	Neurotransmitter Receptor	Microarray
NPGPR	Hs.99231	Neuronal	Neurotransmitter Receptor	Microarray
NPR2	Hs.78518	Neuronal	Neurotransmitter Receptor	
NPR3	Hs.123655	Neuronal	Neurotransmitter Receptor	
NPY1R	Hs.169266	Neuronal	Neurotransmitter Receptor	
NPY2R	Hs.37125	Neuronal	Neurotransmitter Receptor	
NPY5R	Hs.158330	Neuronal	Neurotransmitter Receptor	
NTSR2	Hs.131138	Neuronal	Neurotransmitter Receptor	
OT7T022	Hs.302026	Neuronal	Neurotransmitter Receptor	Microarray
PNR	Hs.248198	Neuronal	Neurotransmitter Receptor	Microarray
SLC6A4	Hs.553	Neuronal	Neurotransmitter Receptor	
TACR2	Hs.161305	Neuronal	Neurotransmitter Receptor	
Tar1	Hs.375030	Neuronal	Neurotransmitter Receptor	
VIPR2	Hs.2126	Neuronal	Neurotransmitter Receptor	Microarray
EFNA1	Hs.399713	Neuronal	Other Neuronal Function	
EFNA2	Hs.158306	Neuronal	Other Neuronal Function	Microarray
EFNA3	Hs.37054	Neuronal	Other Neuronal Function	Microarray
EFNA4	Hs.3796	Neuronal	Other Neuronal Function	Both Databases
EFNA5	Hs.37142	Neuronal	Other Neuronal Function	Microarray

EFNB1	Hs.144700	Neuronal	Other Neuronal Function	Microarray
EFNB2	Hs.30942	Neuronal	Other Neuronal Function	Microarray
EFNB3	Hs.26988	Neuronal	Other Neuronal Function	Microarray
EPHA1	Hs.89839	Neuronal	Other Neuronal Function	Microarray
EPHA2	Hs.171596	Neuronal	Other Neuronal Function	
EPHA3	Hs.123642	Neuronal	Other Neuronal Function	Microarray
EPHA4	Hs.73964	Neuronal	Other Neuronal Function	
EPHA5	Hs.31092	Neuronal	Other Neuronal Function	
EPHA7	Hs.73962	Neuronal	Other Neuronal Function	
EPHA8	Hs.283613	Neuronal	Other Neuronal Function	
EPHB1	Hs.272311	Neuronal	Other Neuronal Function	
EPHB2	Hs.125124	Neuronal	Other Neuronal Function	
EPHB3	Hs.2913	Neuronal	Other Neuronal Function	
EPHB4	Hs.155227	Neuronal	Other Neuronal Function	Microarray
GFAP	Hs.406397	Neuronal	Other Neuronal Function	
PLXNB1	Hs.278311	Neuronal	Other Neuronal Function	Microarray
PLXNC1	Hs.286229	Neuronal	Other Neuronal Function	Both Databases
SEMA3A	Hs.2414	Neuronal	Other Neuronal Function	
SEMA3B	Hs.82222	Neuronal	Other Neuronal Function	
SEMA3C	Hs.171921	Neuronal	Other Neuronal Function	Microarray
SEMA3D	Hs.374773	Neuronal	Other Neuronal Function	
SEMA3E	Hs.212414	Neuronal	Other Neuronal Function	Microarray
SEMA3F	Hs.32981	Neuronal	Other Neuronal Function	
SEMA4B	Hs.9598	Neuronal	Other Neuronal Function	EST
SEMA4F	Hs.25887	Neuronal	Other Neuronal Function	Microarray
SEMA4G	Hs.169549	Neuronal	Other Neuronal Function	Microarray
SEMA5A	Hs.27621	Neuronal	Other Neuronal Function	
SEMA5B	Hs.61384	Neuronal	Other Neuronal Function	
SEMA6A	Hs.263395	Neuronal	Other Neuronal Function	Microarray
SEMA6B	Hs.148932	Neuronal	Other Neuronal Function	Microarray
SEMA6D	Hs.191098	Neuronal	Other Neuronal Function	
SEMA7A	Hs.24640	Neuronal	Other Neuronal Function	Microarray
ADG-90	Hs.334897	Neuronal	Regulated by Neurotransmitters	
RGS9	Hs.117149	Neuronal	Regulated by Neurotransmitters	Both Databases
ADRA2A	Hs.249159	Neuronal	Regulates Neurotransmitter Activity	Microarray
ADRA2C	Hs.123022	Neuronal	Regulates Neurotransmitter Activity	
ADRBK1	Hs.83636	Neuronal	Regulates Neurotransmitter Activity	EST
ADRBK2	Hs.13944	Neuronal	Regulates Neurotransmitter Activity	EST
ARIX	Hs.276879	Neuronal	Regulates Neurotransmitter Activity	
CACNA1A	Hs.96253	Neuronal	Regulates Neurotransmitter Activity	Microarray
CALCYON	Hs.148680	Neuronal	Regulates Neurotransmitter Activity	
CDV-1	Hs.333120	Neuronal	Regulates Neurotransmitter Activity	EST
CTBP2	Hs.171391	Neuronal	Regulates Neurotransmitter Activity	Microarray
DBI	Hs.78888	Neuronal	Regulates Neurotransmitter Activity	Both Databases
GABARAP	Hs.7719	Neuronal	Regulates Neurotransmitter Activity	Both Databases
GDNF	Hs.248114	Neuronal	Regulates Neurotransmitter Activity	Microarray
GFRA1	Hs.105445	Neuronal	Regulates Neurotransmitter Activity	
GPHN	Hs.13405	Neuronal	Regulates Neurotransmitter Activity	Microarray
HRH3	Hs.251399	Neuronal	Regulates Neurotransmitter Activity	Microarray
HSPC228	Hs.267288	Neuronal	Regulates Neurotransmitter Activity	Both Databases

KLF16	Hs.303194	Neuronal	Regulates Neurotransmitter Activity	Microarray
MEIS2	Hs.104105	Neuronal	Regulates Neurotransmitter Activity	Microarray
NOSTRIN	Hs.10260	Neuronal	Regulates Neurotransmitter Activity	
NTT5	Hs.59260	Neuronal	Regulates Neurotransmitter Activity	Microarray
NTT73	Hs.44424	Neuronal	Regulates Neurotransmitter Activity	
OPRK1	Hs.89455	Neuronal	Regulates Neurotransmitter Activity	Microarray
PPP1R1B	Hs.286192	Neuronal	Regulates Neurotransmitter Activity	
PTPN4	Hs.73826	Neuronal	Regulates Neurotransmitter Activity	
SLC18A1	Hs.158322	Neuronal	Regulates Neurotransmitter Activity	
SLC18A2	Hs.1813	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC18A3	Hs.459	Neuronal	Regulates Neurotransmitter Activity	
SLC1A1	Hs.91139	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC1A2	Hs.380	Neuronal	Regulates Neurotransmitter Activity	
SLC1A3	Hs.75379	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC22A3	Hs.81086	Neuronal	Regulates Neurotransmitter Activity	
SLC25A20	Hs.13845	Neuronal	Regulates Neurotransmitter Activity	EST
SLC6A1	Hs.22003	Neuronal	Regulates Neurotransmitter Activity	
SLC6A11	Hs.123639	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC6A12	Hs.82535	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC6A13	Hs.126852	Neuronal	Regulates Neurotransmitter Activity	
SLC6A14	Hs.162211	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC6A2	Hs.78036	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC6A3	Hs.406	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC6A5	Hs.136557	Neuronal	Regulates Neurotransmitter Activity	
SLC6A6	Hs.1194	Neuronal	Regulates Neurotransmitter Activity	Both Databases
SLC6A8	Hs.187958	Neuronal	Regulates Neurotransmitter Activity	Microarray
SLC6A9	Hs.121499	Neuronal	Regulates Neurotransmitter Activity	Microarray
SNAP25	Hs.84389	Neuronal	Regulates Neurotransmitter Activity	Microarray
STX1A	Hs.75671	Neuronal	Regulates Neurotransmitter Activity	Microarray
STXBP1	Hs.239356	Neuronal	Regulates Neurotransmitter Activity	Microarray
STXBP5	Hs.184319	Neuronal	Regulates Neurotransmitter Activity	EST
SYN1	Hs.225936	Neuronal	Regulates Neurotransmitter Activity	
SYN2	Hs.6439	Neuronal	Regulates Neurotransmitter Activity	Microarray
SYN3	Hs.125878	Neuronal	Regulates Neurotransmitter Activity	Microarray
VAMP2	Hs.25348	Neuronal	Regulates Neurotransmitter Activity	EST
PMX2B	Hs.87202	Neuronal	Regulates Neurotransmitter Expression	Microarray
SLC6A7	Hs.241597	Neuronal	Regulates Neurotransmitter Expression	Microarray
ARNTL	Hs.74515	Other	Circadian	Microarray
CSNK1E	Hs.79658	Other	Circadian	EST
NR1D1	Hs.276916	Other	Circadian	Both Databases
PER1	Hs.68398	Other	Circadian	Both Databases
PER2	Hs.153405	Other	Circadian	Microarray
PER3	Hs.12592	Other	Circadian	
TIMELESS	Hs.118631	Other	Circadian	EST
ARTN	Hs.194689	Other	Growth Factor	Microarray
BDNF	Hs.56023	Other	Growth Factor	
EGF	Hs.2230	Other	Growth Factor	
EREG	Hs.115263	Other	Growth Factor	EST
FGF1	Hs.75297	Other	Growth Factor	
FGF2	Hs.284244	Other	Growth Factor	Microarray

FGF3	Hs.37092	Other	Growth Factor	Microarray
FIGF	Hs.11392	Other	Growth Factor	
GDF10	Hs.2171	Other	Growth Factor	Microarray
HGF	Hs.396530	Other	Growth Factor	
IGF1	Hs.85112	Other	Growth Factor	
IGF2	Hs.349109	Other	Growth Factor	Microarray
MDK	Hs.82045	Other	Growth Factor	
MST1	Hs.349110	Other	Growth Factor	Microarray
NELL2	Hs.79389	Other	Growth Factor	Both Databases
NGFB	Hs.2561	Other	Growth Factor	Microarray
NMB	Hs.83321	Other	Growth Factor	Microarray
NRG1	Hs.172816	Other	Growth Factor	Both Databases
NRTN	Hs.234775	Other	Growth Factor	
PDGFA	Hs.37040	Other	Growth Factor	
PDGFB	Hs.1976	Other	Growth Factor	Microarray
PDGFC	Hs.43080	Other	Growth Factor	EST
PTN	Hs.44	Other	Growth Factor	
TGFA	Hs.170009	Other	Growth Factor	Microarray
TGFB1	Hs.1103	Other	Growth Factor	Both Databases
TGFB2	Hs.169300	Other	Growth Factor	
TGFB3	Hs.2025	Other	Growth Factor	
EGFR	Hs.77432	Other	Growth Factor Receptor	Microarray
ERBB2	Hs.323910	Other	Growth Factor Receptor	Microarray
ERBB3	Hs.199067	Other	Growth Factor Receptor	
IGF1R	Hs.239176	Other	Growth Factor Receptor	
MET	Hs.419124	Other	Growth Factor Receptor	
NMBR	Hs.79042	Other	Growth Factor Receptor	
NRP2	Hs.17778	Other	Growth Factor Receptor	EST
NTRK1	Hs.406293	Other	Growth Factor Receptor	
NTRK2	Hs.47860	Other	Growth Factor Receptor	Microarray
NTRK3	Hs.26776	Other	Growth Factor Receptor	Microarray
PDGFRA	Hs.74615	Other	Growth Factor Receptor	
PDGFRB	Hs.76144	Other	Growth Factor Receptor	EST
PDGFRL	Hs.170040	Other	Growth Factor Receptor	Microarray
CRYAB	Hs.391270	Other	Heat shock	
HARC	Hs.128646	Other	Heat shock	Microarray
HSP105B	Hs.36927	Other	Heat shock	Both Databases
HSPA1A	Hs.75452	Other	Heat shock	EST
HSPA1B	Hs.274402	Other	Heat shock	Both Databases
HSPA1L	Hs.80288	Other	Heat shock	Microarray
HSPA2	Hs.432648	Other	Heat shock	
HSPA4	Hs.90093	Other	Heat shock	Microarray
HSPA5	Hs.75410	Other	Heat shock	EST
HSPA6	Hs.3268	Other	Heat shock	Both Databases
HSPA8	Hs.180414	Other	Heat shock	Both Databases
HSPA9B	Hs.3069	Other	Heat shock	EST
HSPB2	Hs.78846	Other	Heat shock	
HSPB3	Hs.41707	Other	Heat shock	
HSPB7	Hs.56874	Other	Heat shock	
HSPCA	Hs.356531	Other	Heat shock	EST

HSPCB	Hs.74335	Other	Heat shock	Both Databases
HSPD1	Hs.79037	Other	Heat shock	
HSPE1	Hs.1197	Other	Heat shock	EST
TRPV2	Hs.279746	Other	Heat shock	EST
ACCN3	Hs.98547	Other	Homeostasis & Small Molecule transport	Both Databases
CACNA1B	Hs.69949	Other	Homeostasis & Small Molecule transport	
CACNA1D	Hs.23838	Other	Homeostasis & Small Molecule transport	Microarray
CACNB1	Hs.635	Other	Homeostasis & Small Molecule transport	
CACNB2	Hs.30941	Other	Homeostasis & Small Molecule transport	Microarray
CACNB3	Hs.250712	Other	Homeostasis & Small Molecule transport	Microarray
CACNB4	Hs.21903	Other	Homeostasis & Small Molecule transport	
CACNG2	Hs.268545	Other	Homeostasis & Small Molecule transport	Microarray
CFTR	Hs.663	Other	Homeostasis & Small Molecule transport	
GCK	Hs.1270	Other	Homeostasis & Small Molecule transport	Microarray
GCKR	Hs.89771	Other	Homeostasis & Small Molecule transport	
RGN	Hs.77854	Other	Homeostasis & Small Molecule transport	
SCN1A	Hs.22654	Other	Homeostasis & Small Molecule transport	
SCN1B	Hs.170238	Other	Homeostasis & Small Molecule transport	
SCN2A2	Hs.54499	Other	Homeostasis & Small Molecule transport	Microarray
SCN2B	Hs.129783	Other	Homeostasis & Small Molecule transport	Microarray
SCN3A	Hs.300717	Other	Homeostasis & Small Molecule transport	
SCN4A	Hs.46038	Other	Homeostasis & Small Molecule transport	
SCN5A	Hs.169331	Other	Homeostasis & Small Molecule transport	
SCN7A	Hs.406684	Other	Homeostasis & Small Molecule transport	
SCN9A	Hs.2319	Other	Homeostasis & Small Molecule transport	
SLC11A1	Hs.182611	Other	Homeostasis & Small Molecule transport	EST
SLC11A2	Hs.57435	Other	Homeostasis & Small Molecule transport	Microarray
SLC15A2	Hs.182575	Other	Homeostasis & Small Molecule transport	Microarray
SLC22A5	Hs.15813	Other	Homeostasis & Small Molecule transport	
SLC25A3	Hs.78713	Other	Homeostasis & Small Molecule transport	EST
SLC25A4	Hs.2043	Other	Homeostasis & Small Molecule transport	Microarray
SLC25A5	Hs.79172	Other	Homeostasis & Small Molecule transport	Both Databases
SLC29A1	Hs.25450	Other	Homeostasis & Small Molecule transport	Both Databases
SLC2A11	Hs.9475	Other	Homeostasis & Small Molecule transport	
SLC2A4	Hs.95958	Other	Homeostasis & Small Molecule transport	Microarray
TRPM2		Other	Homeostasis & Small Molecule transport	
TRPV1	Hs.283010	Other	Homeostasis & Small Molecule transport	Microarray
UGTREL1	Hs.154073	Other	Homeostasis & Small Molecule transport	Microarray
VDAC2	Hs.78902	Other	Homeostasis & Small Molecule transport	Both Databases
VDAC3	Hs.7381	Other	Homeostasis & Small Molecule transport	
VIAAT	Hs.179080	Other	Homeostasis & Small Molecule transport	Microarray
ALOXE3	Hs.232770	Other	Other	Microarray
CSTA	Hs.412999	Other	Other	
F3	Hs.62192	Other	Other	Microarray
FADS1	Hs.132898	Other	Other	Both Databases
FURIN	Hs.59242	Other	Other	Both Databases
LOC56920	Hs.59729	Other	Other	Microarray
PLTP	Hs.283007	Other	Other	Both Databases
POLE4	Hs.19980	Other	Other	Microarray
PPARGC1	Hs.198468	Other	Other	

PSAP	Hs.406455	Other	Other	EST
RPS10	Hs.356491	Other	Other	
RPS5	Hs.356019	Other	Other	EST
SSBP1	Hs.923	Other	Other	Both Databases
TIMM23	Hs.11866	Other	Other	EST
TRO	Hs.259802	Other	Other	Microarray
TXNIP	Hs.179526	Other	Other	Both Databases
UBB	Hs.356190	Other	Other	EST
UBC	Hs.183704	Other	Other	EST
CADPS	Hs.151301	Other	Other Neuroendocrine Function	Microarray
CALCA	Hs.37058	Other	Other Neuroendocrine Function	Microarray
CALCB	Hs.274534	Other	Other Neuroendocrine Function	
DLG3	Hs.11101	Other	Other Neuroendocrine Function	Both Databases
DLK1	Hs.169228	Other	Other Neuroendocrine Function	Microarray
EPHX2	Hs.113	Other	Other Neuroendocrine Function	
GMFB	Hs.151413	Other	Other Neuroendocrine Function	Microarray
GMFG	Hs.5210	Other	Other Neuroendocrine Function	Both Databases
HIP1	Hs.97206	Other	Other Neuroendocrine Function	
IAPP	Hs.142255	Other	Other Neuroendocrine Function	
INSM1	Hs.89584	Other	Other Neuroendocrine Function	
PRX	Hs.205457	Other	Other Neuroendocrine Function	
PTPRN	Hs.89655	Other	Other Neuroendocrine Function	Microarray
RAMP1	Hs.32989	Other	Other Neuroendocrine Function	Microarray
RAMP2	Hs.155106	Other	Other Neuroendocrine Function	Microarray
RAMP3	Hs.25691	Other	Other Neuroendocrine Function	Microarray
RCP9	Hs.300684	Other	Other Neuroendocrine Function	Microarray
RTN1	Hs.99947	Other	Other Neuroendocrine Function	
RTN2	Hs.3803	Other	Other Neuroendocrine Function	Both Databases
RTN3	Hs.252831	Other	Other Neuroendocrine Function	Both Databases
RTN4	Hs.65450	Other	Other Neuroendocrine Function	EST
SCAMP2	Hs.238030	Other	Other Neuroendocrine Function	Both Databases
SCG2	Hs.75426	Other	Other Neuroendocrine Function	
SCGB1A1	Hs.2240	Other	Other Neuroendocrine Function	
SCGN	Hs.116428	Other	Other Neuroendocrine Function	Microarray
SCP2	Hs.75760	Other	Other Neuroendocrine Function	EST
SGNE1	Hs.2265	Other	Other Neuroendocrine Function	Both Databases
SNAP23	Hs.184376	Other	Other Neuroendocrine Function	Both Databases
SNAP29	Hs.194714	Other	Other Neuroendocrine Function	
SR-BP1	Hs.24447	Other	Other Neuroendocrine Function	Both Databases
SYP	Hs.75667	Other	Other Neuroendocrine Function	
TFRC	Hs.77356	Other	Other Neuroendocrine Function	EST
TLOC1	Hs.8146	Other	Other Neuroendocrine Function	Both Databases
UCHL1	Hs.76118	Other	Other Neuroendocrine Function	Microarray
A2M	Hs.74561	Other	Protease Inhibitor	EST
CST3	Hs.304682	Other	Protease Inhibitor	EST
CST7	Hs.143212	Other	Protease Inhibitor	Both Databases
LOC139216	Hs.447335	Other	Protease Inhibitor	
SERPINA6	Hs.1305	Other	Protease Inhibitor	Microarray
SERPINE1	Hs.82085	Other	Protease Inhibitor	Microarray
TFPI	Hs.170279	Other	Protease Inhibitor	

TFPI2	Hs.295944	Other	Protease Inhibitor	
TIMP1	Hs.433425	Other	Protease Inhibitor	EST
ALOX15B	Hs.111256	Other	Regulation of Cell Growth	
ATM	Hs.194382	Other	Regulation of Cell Growth	Microarray
CDC37	Hs.160958	Other	Regulation of Cell Growth	Both Databases
CDKN1A	Hs.179665	Other	Regulation of Cell Growth	Both Databases
DUSP1	Hs.171695	Other	Regulation of Cell Growth	Both Databases
DUSP10	Hs.177534	Other	Regulation of Cell Growth	Both Databases
DUSP11	Hs.14611	Other	Regulation of Cell Growth	EST
DUSP12	Hs.44229	Other	Regulation of Cell Growth	
DUSP13	Hs.178170	Other	Regulation of Cell Growth	Microarray
DUSP15	Hs.375624	Other	Regulation of Cell Growth	
DUSP18	Hs.128782	Other	Regulation of Cell Growth	EST
DUSP19	Hs.132237	Other	Regulation of Cell Growth	
DUSP2	Hs.1183	Other	Regulation of Cell Growth	Both Databases
DUSP21	Hs.15572	Other	Regulation of Cell Growth	Microarray
DUSP22	Hs.29106	Other	Regulation of Cell Growth	Both Databases
DUSP3	Hs.181046	Other	Regulation of Cell Growth	
DUSP4	Hs.2359	Other	Regulation of Cell Growth	Both Databases
DUSP5	Hs.2128	Other	Regulation of Cell Growth	EST
DUSP6	Hs.180383	Other	Regulation of Cell Growth	EST
DUSP7	Hs.296938	Other	Regulation of Cell Growth	
DUSP9	Hs.144879	Other	Regulation of Cell Growth	
EPS15	Hs.79095	Other	Regulation of Cell Growth	EST
EPS15R	Hs.147176	Other	Regulation of Cell Growth	EST
GFRA2	Hs.19317	Other	Regulation of Cell Growth	
GRB7	Hs.86859	Other	Regulation of Cell Growth	Microarray
HGFAC	Hs.104	Other	Regulation of Cell Growth	
HGS	Hs.416959	Other	Regulation of Cell Growth	
IGFBP2	Hs.433326	Other	Regulation of Cell Growth	
IGFBP3	Hs.77326	Other	Regulation of Cell Growth	Microarray
IGFBP4	Hs.1516	Other	Regulation of Cell Growth	
IGFBP5	Hs.416739	Other	Regulation of Cell Growth	
IGFBP6	Hs.274313	Other	Regulation of Cell Growth	Microarray
KIT	Hs.81665	Other	Regulation of Cell Growth	
MT1H	Hs.2667	Other	Regulation of Cell Growth	
MT2A	Hs.118786	Other	Regulation of Cell Growth	
MT3	Hs.73133	Other	Regulation of Cell Growth	Microarray
MYC	Hs.79070	Other	Regulation of Cell Growth	Both Databases
NGFRAP1	Hs.381039	Other	Regulation of Cell Growth	
NRG2	Hs.113264	Other	Regulation of Cell Growth	Microarray
NTF3	Hs.99171	Other	Regulation of Cell Growth	
NTF5	Hs.266902	Other	Regulation of Cell Growth	
PAPPA	Hs.75874	Other	Regulation of Cell Growth	
PLG	Hs.75576	Other	Regulation of Cell Growth	
PPM1A	Hs.57764	Other	Regulation of Cell Growth	EST
PPM1D	Hs.100980	Other	Regulation of Cell Growth	
PRSS11	Hs.75111	Other	Regulation of Cell Growth	Both Databases
PSPN	Hs.248159	Other	Regulation of Cell Growth	Microarray
PTCH	Hs.159526	Other	Regulation of Cell Growth	Microarray

PTCH2	Hs.249164	Other	Regulation of Cell Growth	
PTPN2	Hs.82829	Other	Regulation of Cell Growth	
PTPN3	Hs.153932	Other	Regulation of Cell Growth	Microarray
SNT-1	Hs.251394	Other	Regulation of Cell Growth	Microarray
SNT-2	Hs.194208	Other	Regulation of Cell Growth	Microarray
SPINT1	Hs.233950	Other	Regulation of Cell Growth	Both Databases
SPINT2	Hs.31439	Other	Regulation of Cell Growth	Both Databases
SRC	Hs.198298	Other	Regulation of Cell Growth	
TEK	Hs.89640	Other	Regulation of Cell Growth	Microarray
VGF	Hs.171014	Other	Regulation of Cell Growth	Microarray
WISP2	Hs.194679	Other	Regulation of Cell Growth	Microarray
WISP3	Hs.194678	Other	Regulation of Cell Growth	
WNT1	Hs.248164	Other	Regulation of Cell Growth	
WNT10B	Hs.91985	Other	Regulation of Cell Growth	Microarray
WNT2	Hs.89791	Other	Regulation of Cell Growth	
AIP	Hs.75305	Other	Signal Transduction	EST
AKAP9	Hs.58103	Other	Signal Transduction	Both Databases
ARRB1	Hs.112278	Other	Signal Transduction	Both Databases
BMX	Hs.27372	Other	Signal Transduction	Microarray
DUSP16	Hs.20281	Other	Signal Transduction	Both Databases
DUSP8	Hs.41688	Other	Signal Transduction	Microarray
FLT3	Hs.385	Other	Signal Transduction	
FLT3LG	Hs.428	Other	Signal Transduction	Both Databases
FYB	Hs.58435	Other	Signal Transduction	
GAB2	Hs.30687	Other	Signal Transduction	Microarray
GADD45B	Hs.110571	Other	Signal Transduction	Both Databases
GFRA3	Hs.58042	Other	Signal Transduction	
GFRA4	Hs.302025	Other	Signal Transduction	Microarray
GRAP2	Hs.193076	Other	Signal Transduction	Both Databases
IL6ST	Hs.82065	Other	Signal Transduction	Microarray
IRAK1	Hs.182018	Other	Signal Transduction	Both Databases
IRAK2	Hs.249175	Other	Signal Transduction	Microarray
IRAK3	Hs.268552	Other	Signal Transduction	
IRAK4	Hs.142295	Other	Signal Transduction	EST
ITK	Hs.211576	Other	Signal Transduction	Both Databases
JAK1	Hs.50651	Other	Signal Transduction	
JAK2	Hs.115541	Other	Signal Transduction	
JAK3	Hs.99877	Other	Signal Transduction	Both Databases
LCK	Hs.1765	Other	Signal Transduction	EST
LOC55971	Hs.23449	Other	Signal Transduction	Microarray
MAP2K1	Hs.3446	Other	Signal Transduction	EST
MAP2K3	Hs.180533	Other	Signal Transduction	Both Databases
MAP2K4	Hs.75217	Other	Signal Transduction	Microarray
MAP2K6	Hs.118825	Other	Signal Transduction	Microarray
MAP2K7	Hs.110299	Other	Signal Transduction	
MAP3K10	Hs.30223	Other	Signal Transduction	Microarray
MAP3K11	Hs.89449	Other	Signal Transduction	Both Databases
MAP3K12	Hs.211601	Other	Signal Transduction	EST
MAP3K13	Hs.377067	Other	Signal Transduction	
MAP3K2	Hs.28827	Other	Signal Transduction	

MAP3K3	Hs.29282	Other	Signal Transduction	Both Databases
MAP3K4	Hs.32353	Other	Signal Transduction	Microarray
MAP3K7	Hs.7510	Other	Signal Transduction	Microarray
MAP3K8	Hs.248	Other	Signal Transduction	EST
MAP4K1	Hs.95424	Other	Signal Transduction	EST
MAP4K3	Hs.399752	Other	Signal Transduction	
MAPK1	Hs.324473	Other	Signal Transduction	EST
MAPK10	Hs.151051	Other	Signal Transduction	Microarray
MAPK13	Hs.178695	Other	Signal Transduction	Both Databases
MAPK14	Hs.79107	Other	Signal Transduction	Both Databases
MAPK8	Hs.267445	Other	Signal Transduction	Microarray
MAPK8IP1	Hs.234249	Other	Signal Transduction	Microarray
MAPK8IP2	Hs.356523	Other	Signal Transduction	
MAPK8IP3	Hs.88500	Other	Signal Transduction	EST
MAPK9	Hs.246857	Other	Signal Transduction	
MAPKAPK2	Hs.75074	Other	Signal Transduction	Both Databases
MATK	Hs.274	Other	Signal Transduction	EST
MS4A3	Hs.99960	Other	Signal Transduction	
MS4A4A	Hs.325960	Other	Signal Transduction	EST
MS4A5	Hs.178066	Other	Signal Transduction	
MS4A6A	Hs.17914	Other	Signal Transduction	Both Databases
MS4A7	Hs.11090	Other	Signal Transduction	Both Databases
pknbeta	Hs.44101	Other	Signal Transduction	Microarray
PLA2G1B	Hs.992	Other	Signal Transduction	Microarray
PRKCA	Hs.169449	Other	Signal Transduction	EST
PRKCB1	Hs.77202	Other	Signal Transduction	EST
PRKCD	Hs.155342	Other	Signal Transduction	Both Databases
PRKCE	Hs.211592	Other	Signal Transduction	
PTPN6	Hs.63489	Other	Signal Transduction	Both Databases
PTPNS1	Hs.156114	Other	Signal Transduction	Both Databases
RAF1	Hs.349650	Other	Signal Transduction	EST
S100A12	Hs.19413	Other	Signal Transduction	
SCAP1	Hs.19126	Other	Signal Transduction	EST
SCAP2	Hs.52644	Other	Signal Transduction	EST
SGKL	Hs.380877	Other	Signal Transduction	
SITPEC	Hs.22199	Other	Signal Transduction	Both Databases
TEC	Hs.89656	Other	Signal Transduction	
TIRAP	Hs.17681	Other	Signal Transduction	EST
TRAF6	Hs.90957	Other	Signal Transduction	Both Databases
TYK2	Hs.75516	Other	Signal Transduction	EST
YWHAB	Hs.182238	Other	Signal Transduction	Both Databases
Cyt19	Hs.349396	Other	Stress Response	Both Databases
GADD45A	Hs.80409	Other	Stress Response	EST
GADD45G	Hs.9701	Other	Stress Response	Microarray
GPX1	Hs.76686	Other	Stress Response	Both Databases
GSR	Hs.193974	Other	Stress Response	EST
GSTM3	Hs.2006	Other	Stress Response	EST
NR1	Hs.154899	Other	Stress Response	EST
SOD1	Hs.75428	Other	Stress Response	Both Databases
SOD2	Hs.372783	Other	Stress Response	EST

STIP1	Hs.355930	Other	Stress Response	EST
AHR	Hs.170087	Other	Transcription Factor	Microarray
ASCL1	Hs.1619	Other	Transcription Factor	Microarray
ATF2	Hs.198166	Other	Transcription Factor	
ATF3	Hs.460	Other	Transcription Factor	Both Databases
BATF	Hs.41691	Other	Transcription Factor	Both Databases
CDX1	Hs.1545	Other	Transcription Factor	
CEBPA	Hs.76171	Other	Transcription Factor	Microarray
CEBPB	Hs.99029	Other	Transcription Factor	Microarray
CEBPG	Hs.2227	Other	Transcription Factor	Microarray
CLOCK	Hs.150602	Other	Transcription Factor	EST
CNOT2	Hs.239720	Other	Transcription Factor	Both Databases
DAT1	Hs.301914	Other	Transcription Factor	
DBP	Hs.414480	Other	Transcription Factor	
DSIPI	Hs.75450	Other	Transcription Factor	EST
EGR1	Hs.326035	Other	Transcription Factor	EST
ELK1	Hs.181128	Other	Transcription Factor	Both Databases
EN1	Hs.271977	Other	Transcription Factor	
EN2	Hs.134989	Other	Transcription Factor	
ENO1	Hs.254105	Other	Transcription Factor	Both Databases
ETS1	Hs.18063	Other	Transcription Factor	EST
FOS	Hs.25647	Other	Transcription Factor	Both Databases
FOXA1	Hs.70604	Other	Transcription Factor	
FOXA2	Hs.155651	Other	Transcription Factor	Microarray
FOXA3	Hs.36137	Other	Transcription Factor	Microarray
FOXP3	Hs.247700	Other	Transcription Factor	Microarray
GATA3	Hs.169946	Other	Transcription Factor	EST
GIOT-1	Hs.157203	Other	Transcription Factor	
GIOT-2	Hs.251371	Other	Transcription Factor	Microarray
GIOT-3	Hs.102397	Other	Transcription Factor	
GMEB2	Hs.28906	Other	Transcription Factor	Microarray
GRLF1	Hs.102548	Other	Transcription Factor	
HMGB1	Hs.434102	Other	Transcription Factor	
HOXA1	Hs.67397	Other	Transcription Factor	Microarray
HOXB1	Hs.99992	Other	Transcription Factor	Microarray
HSF1	Hs.380935	Other	Transcription Factor	EST
ICSBP1	Hs.14453	Other	Transcription Factor	Both Databases
ILF1	Hs.296281	Other	Transcription Factor	Both Databases
ILF2	Hs.75117	Other	Transcription Factor	EST
ILF3	Hs.256583	Other	Transcription Factor	Both Databases
IRF1	Hs.80645	Other	Transcription Factor	Both Databases
IRF2	Hs.83795	Other	Transcription Factor	Both Databases
IRF3	Hs.75254	Other	Transcription Factor	Both Databases
IRF5	Hs.334450	Other	Transcription Factor	EST
IRF6	Hs.11801	Other	Transcription Factor	
IRF7	Hs.166120	Other	Transcription Factor	Both Databases
ISGF3G	Hs.1706	Other	Transcription Factor	Both Databases
JUN	Hs.78465	Other	Transcription Factor	EST
JUNB	Hs.400124	Other	Transcription Factor	EST
LOC170067	Hs.447895	Other	Transcription Factor	

MAFF	Hs.51305	Other	Transcription Factor	Microarray
MAZ	Hs.7647	Other	Transcription Factor	EST
MDM2	Hs.170027	Other	Transcription Factor	
MEF2C	Hs.78995	Other	Transcription Factor	
MIZIP	Hs.128096	Other	Transcription Factor	
NFATC3	Hs.172674	Other	Transcription Factor	EST
NFKB1	Hs.83428	Other	Transcription Factor	Microarray
NFKB2	Hs.73090	Other	Transcription Factor	EST
NFKBIA	Hs.81328	Other	Transcription Factor	Both Databases
NFKBIB	Hs.9731	Other	Transcription Factor	Both Databases
NFKBIE	Hs.182885	Other	Transcription Factor	EST
NFKBIL1	Hs.2764	Other	Transcription Factor	Both Databases
NFRKB	Hs.374357	Other	Transcription Factor	
NFX1	Hs.3187	Other	Transcription Factor	Both Databases
NMI	Hs.54483	Other	Transcription Factor	
NR1I2	Hs.118138	Other	Transcription Factor	Microarray
NRF	Hs.119018	Other	Transcription Factor	
P38IP	Hs.376447	Other	Transcription Factor	EST
PIAS1	Hs.75251	Other	Transcription Factor	Both Databases
POU1F1	Hs.89394	Other	Transcription Factor	
PRDM1	Hs.158303	Other	Transcription Factor	Microarray
RFX2	Hs.100007	Other	Transcription Factor	
SLC2A4RG	Hs.254837	Other	Transcription Factor	
SMARCA2	Hs.198296	Other	Transcription Factor	Microarray
SMARCF1	Hs.123090	Other	Transcription Factor	Both Databases
STAT1	Hs.21486	Other	Transcription Factor	Both Databases
STAT2	Hs.72988	Other	Transcription Factor	Microarray
STAT3	Hs.321677	Other	Transcription Factor	EST
STAT4	Hs.80642	Other	Transcription Factor	EST
STAT5A	Hs.167503	Other	Transcription Factor	Both Databases
STAT5B	Hs.244613	Other	Transcription Factor	
STAT6	Hs.181015	Other	Transcription Factor	EST
TAF9	Hs.60679	Other	Transcription Factor	Both Databases
TBX19	Hs.50403	Other	Transcription Factor	
TBX21	Hs.272409	Other	Transcription Factor	
TCF1	Hs.73888	Other	Transcription Factor	
TCF4	Hs.326198	Other	Transcription Factor	EST
TCF7	Hs.169294	Other	Transcription Factor	Microarray
TCF8	Hs.232068	Other	Transcription Factor	
TFE3	Hs.274184	Other	Transcription Factor	Both Databases
TRIAD3	Hs.86228	Other	Transcription Factor	Microarray
TRIM34	Hs.125300	Other	Transcription Factor	Microarray
UBP1	Hs.28423	Other	Transcription Factor	Microarray
ZFP36	Hs.343586	Other	Transcription Factor	Microarray
ZFP36L1	Hs.85155	Other	Transcription Factor	Both Databases
ZIC2	Hs.132863	Other	Transcription Factor	Microarray
ZNF14	Hs.197219	Other	Transcription Factor	Microarray
ZNF147	Hs.1579	Other	Transcription Factor	EST
ZNF161	Hs.223754	Other	Transcription Factor	
ZNF259	Hs.7165	Other	Transcription Factor	EST

ZNF398	Hs.169452	Other	Transcription Factor	
EBI2	Hs.784	Other	Unknown Function	Both Databases
NFKBIL2	Hs.356764	Other	Unknown Function	EST
PTPN18	Hs.278597	Other	Unknown Function	Both Databases
WSB1	Hs.187991	Other	Unknown Function	Microarray

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V. CLAIMS

What is claimed is:

1. A microarray comprising probes for genes involved in pscyhoneuroendocrinimmune (PNI) activity.

2. The microarray of claim 1, wherein the genes are selected from the group of genes consisting of SEQ ID NO: 1-1741 and 3086-3314.

3. The microarray of claim 2, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1-1741 and 3086-3314, and wherein the number of genes selected is 100.

4. The microarray of claim 2, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1-1741 and 3086-3314, and wherein the number of genes selected is 500.

5. The microarray of claim 2, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1-1741 and 3086-3314, and wherein the number of genes selected is 1000.

6. The microarray of claim 2, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1-1741 and 3086-3314, and wherein the number of genes selected is 1500.

7. The microarray of claim 1, wherein the genes are selected from the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514.

8. The microarray of claim 7, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514, and wherein the number of genes selected is 100.

9. The microarray of claim 7, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514, and wherein the number of genes selected is 200.

10. The microarray of claim 7, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514, and wherein the number of genes selected is 500.

11. The microarray of claim 7, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514, and wherein the number of genes selected is 1000.

12. The microarray of claim 7, wherein the genes are selected from the the group of genes consisting of SEQ ID NO: 1742-3085 and 3315-3514, and wherein the number of genes selected is 1500.

13. A method for diagnosing a condition associated with PNI activity comprising obtaining a tissue sample from a subject, isolating RNA from the sample, placing the RNA on the microarray of any of claims 1, and analyzing the gene expression on the array.

14. The method of claim 13, wherein the condition is selected from the group of PNI associated conditions consisting of CFS, type-2 diabetes, allergic conditions including atopic dermatitis, rheumatic diseases such as rheumatoid arthritis and systemic lupus erythematosus, Sjogren's syndrome, coronary heart disease, inflammatory bowel disease, acute depression, fatigue diseases resulting from defined causes, such as cancer treatment, post traumatic stress disease, susceptibility to alcoholism, Alzheimer's Disease, and cognitive impairment resulting from multiple sclerosis.

15. The method of claim 13, wherein the condition is an inflammatory condition.

16. The method of claim 15, wherein the inflammatory condition is selected from the group of inflammatory conditions consisting of asthma, alopecia areata, systemic lupus erythematosus, rheumatoid arthritis, reactive arthritis, spondylarthritis, systemic vasculitis, insulin dependent diabetes mellitus, multiple sclerosis, experimental allergic encephalomyelitis, Sjögren's syndrome, graft versus host disease, inflammatory bowel disease including Crohn's disease, ulcerative colitis, ischemia reperfusion injury, myocardial infarction, Alzheimer's disease, transplant rejection (allogeneic and xenogeneic), thermal trauma, any immune complex-induced inflammation, glomerulonephritis, myasthenia gravis, cerebral lupus, Guillain-Barre syndrome, vasculitis, systemic sclerosis, anaphlaxis, catheter reactions, atheroma, infertility, thyroiditis, ARDS, post-bypass syndrome, hemodialysis, juvenile rheumatoid, Behcets syndrome, hemolytic anemia, pemphigus, bullous pemphigoid, stroke, atherosclerosis, scleroderma, psoriasis, sarcoidosis, transverse myelitis, acute disseminated encephalomyelitis, post-infectious encephalomyelitis, subacute sclerosing panencephalitis, and chronic inflammatory demyelinating polyradiculopathy.

17. The method of claim 13, wherein the condition is a cancer.

18. The method of claim 17, wherein the cancer is selected from the group of cancers consisting of lymphoma, B cell lymphoma, T cell lymphoma, mycosis fungoides, Hodgkin's Disease, myeloid leukemia, bladder cancer, brain cancer, nervous system cancer, head and neck cancer, squamous cell carcinoma of head and neck, kidney cancer, lung cancers such as small cell lung cancer and non-small cell lung cancer, neuroblastoma/glioblastoma, ovarian cancer, pancreatic cancer, prostate cancer, skin cancer, liver cancer, melanoma, squamous cell carcinomas of the mouth, throat, larynx, and lung, colon cancer, cervical cancer, cervical carcinoma, breast cancer, and epithelial cancer, renal cancer, genitourinary cancer, pulmonary cancer, esophageal carcinoma, head and neck carcinoma, large bowel cancer, hematopoietic cancers; testicular cancer; colon and rectal cancers, prostatic cancer, or pancreatic cancer.

19. The method of claim 13, wherein the condition is an infectious disease.

20. The method of claim 19, wherein the infectious disease is a bacterial infection selected from the group of bacteria consisting of *M. tuberculosis, M. bovis, M. bovis* strain BCG, BCG substrains, *M. avium, M. intracellulare, M. africanum, M. kansasii, M. marinum, M. ulcerans, M. avium* subspecies *paratuberculosis, Nocardia asteroides*, other *Nocardia* species, *Legionella pneumophila*, other *Legionella* species, *Salmonella typhi,* other *Salmonella* species, *Shigella* species, *Yersinia pestis, Pasteurella haemolytica, Pasteurella multocida,* other *Pasteurella species, Actinobacillus pleuropneumoniae, Listeria monocytogenes, Listeria ivanovii, Brucella abortus,* other *Brucella* species, *Cowdria ruminantium, Chlamydia pneumoniae, Chlamydia trachomatis, Chlamydia psittaci, Coxiella burnetti,* other *Rickettsial* species, *Ehrlichia* species, *Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes, Streptococcus agalactiae, Bacillus anthracis, Escherichia coli, Vibrio cholerae, Campylobacter* species, *Neiserria meningitidis, Neiserria gonorrhea, Pseudomonas aeruginosa,* other *Pseudomonas* species, *Haemophilus influenzae, Haemophilus ducreyi,* other *Hemophilus* species, *Clostridium tetani,* other *Clostridium* species, *Yersinia enterolitica,* and other *Yersinia species*.

21. The method of claim 19, wherein the infectious disease is a viral infection selected from the group of viruses consisting of Herpes simplex virus type-1, Herpes simplex virus type-2, Cytomegalovirus, Epstein-Barr virus, Varicella-zoster virus, Human herpesvirus 6, Human herpesvirus 7, Human herpesvirus 8, Variola virus, Vesicular stomatitis virus, Hepatitis A virus, Hepatitis B virus, Hepatitis C virus,

Hepatitis D virus, Hepatitis E virus, Rhinovirus, Coronavirus, Influenza virus A, Influenza virus B, Measles virus, Polyomavirus, Human Papilomavirus, Respiratory syncytial virus, Adenovirus, Coxsackie virus, Dengue virus, Mumps virus, Poliovirus, Rabies virus, Rous sarcoma virus, Yellow fever virus, Ebola virus, Marburg virus, Lassa fever virus, Eastern Equine Encephalitis virus, Japanese Encephalitis virus, St. Louis Encephalitis virus, Murray Valley fever virus, West Nile virus, Rift Valley fever virus, Rotavirus A, Rotavirus B, Rotavirus C, Sindbis virus, Simian Immunodeficiency cirus, Human T-cell Leukemia virus type-1, Hantavirus, Rubella virus, Simian Immunodeficiency virus, Human Immunodeficiency virus type-1, and Human Immunodeficiency virus type-2.

22. The method of claim 19, wherein the infectious disease is a fungal infection selected from the group of fungi consisting of *Candida albicans, Cryptococcus neoformans, Histoplama capsulatum, Aspergillus fumigatus, Coccidiodes immitis, Paracoccidiodes brasiliensis, Blastomyces dermitidis, Pneomocystis carnii, Penicillium marneffi, and Alternaria alternata.*

23. The method of claim 19, wherein the infectious disease is a parasitic infection selected from the group of parasites consisting of *Toxoplasma gondii, Plasmodium falciparum*, *Plasmodium vivax*, *Plasmodium malariae*, other *Plasmodium* species., *Trypanosoma brucei*, *Trypanosoma cruzi*, *Leishmania major*, other *Leishmania* species., *Schistosoma mansoni*, other *Schistosoma* species., and *Entamoeba histolytica*.

24. The method of claim 13, further comprising making a diagnosis based on the pattern of gene expression on the microarray, wherein a pattern matching one associated with a condition indicates the subject has the condition.

25. The method of claim 13, wherein the tissue sample is blood.

26. The method of claim 13, wherein the subject is a mammal.

27. The method of claim 26, wherein the mammal is a human.

28. The method of claim 26, wherein the mammal is a mouse.

29. A method for diagnosing a condition associated with PNI activity comprising obtaining a tissue sample from a subject, isolating RNA from the sample, placing the RNA on a PNI microarray, and analyzing the gene expression on the array.

30. The method of claim 29, wherein the condition is selected from the group of PNI associated conditions consisting of CFS, type-2 diabetes, allergic conditions

including atopic dermatitis, rheumatic diseases such as rheumatoid arthritis and systemic lupus erythematosus, Sjogren's syndrome, coronary heart disease, inflammatory bowel disease, acute depression, fatigue diseases resulting from defined causes, such as cancer treatment, post traumatic stress disease, susceptibility to alcoholism, Alzheimer's Disease, and cognitive impairment resulting from multiple sclerosis.

31. The method of claim 29, wherein the condition is an inflammatory condition.

32. The method of claim 31, wherein the inflammatory condition is selected from the group of inflammatory conditions consisting of asthma, alopecia areata, systemic lupus erythematosus, rheumatoid arthritis, reactive arthritis, spondylarthritis, systemic vasculitis, insulin dependent diabetes mellitus, multiple sclerosis, experimental allergic encephalomyelitis, Sjögren's syndrome, graft versus host disease, inflammatory bowel disease including Crohn's disease, ulcerative colitis, ischemia reperfusion injury, myocardial infarction, Alzheimer's disease, transplant rejection (allogeneic and xenogeneic), thermal trauma, any immune complex-induced inflammation, glomerulonephritis, myasthenia gravis, cerebral lupus, Guillain-Barre syndrome, vasculitis, systemic sclerosis, anaphlaxis, catheter reactions, atheroma, infertility, thyroiditis, ARDS, post-bypass syndrome, hemodialysis, juvenile rheumatoid, Behcets syndrome, hemolytic anemia, pemphigus, bullous pemphigoid, stroke, atherosclerosis, scleroderma, psoriasis, sarcoidosis, transverse myelitis, acute disseminated encephalomyelitis, post-infectious encephalomyelitis, subacute sclerosing panencephalitis, and chronic inflammatory demyelinating polyradiculopathy.

33. The method of claim 29, wherein the condition is a cancer.

34. The method of claim 33, wherein the cancer is selected from the group of cancers consisting of lymphoma, B cell lymphoma, T cell lymphoma, mycosis fungoides, Hodgkin's Disease, myeloid leukemia, bladder cancer, brain cancer, nervous system cancer, head and neck cancer, squamous cell carcinoma of head and neck, kidney cancer, lung cancers such as small cell lung cancer and non-small cell lung cancer, neuroblastoma/glioblastoma, ovarian cancer, pancreatic cancer, prostate cancer, skin cancer, liver cancer, melanoma, squamous cell carcinomas of the mouth, throat, larynx, and lung, colon cancer, cervical cancer, cervical carcinoma, breast cancer, and epithelial cancer, renal cancer, genitourinary cancer, pulmonary cancer, esophageal

carcinoma, head and neck carcinoma, large bowel cancer, hematopoietic cancers; testicular cancer; colon and rectal cancers, prostatic cancer, or pancreatic cancer.

35. The method of claim 29, wherein the condition is an infectious disease.

36. The method of claim 35, wherein the infectious disease is a bacterial infection selected from the group of bacteria consisting of *M. tuberculosis, M. bovis, M. bovis* strain BCG, BCG substrains, *M. avium, M. intracellulare, M. africanum, M. kansasii, M. marinum, M. ulcerans, M. avium* subspecies *paratuberculosis, Nocardia asteroides*, other *Nocardia* species, *Legionella pneumophila*, other *Legionella* species, *Salmonella typhi,* other *Salmonella* species, *Shigella* species, *Yersinia pestis, Pasteurella haemolytica, Pasteurella multocida,* other *Pasteurella species, Actinobacillus pleuropneumoniae, Listeria monocytogenes, Listeria ivanovii, Brucella abortus,* other *Brucella* species, *Cowdria ruminantium, Chlamydia pneumoniae, Chlamydia trachomatis, Chlamydia psittaci, Coxiella burnetti*, other *Rickettsial* species, *Ehrlichia* species, *Staphylococcus aureus, Staphylococcus epidermidis, Streptococcus pyogenes, Streptococcus agalactiae, Bacillus anthracis, Escherichia coli, Vibrio cholerae, Campylobacter* species, *Neiserria meningitidis, Neiserria gonorrhea, Pseudomonas aeruginosa,* other *Pseudomonas* species, *Haemophilus influenzae, Haemophilus ducreyi,* other *Hemophilus* species, *Clostridium tetani,* other *Clostridium* species, *Yersinia enterolitica,* and other *Yersinia species*.

37. The method of claim 35, wherein the infectious disease is a viral infection selected from the group of viruses consisting of Herpes simplex virus type-1, Herpes simplex virus type-2, Cytomegalovirus, Epstein-Barr virus, Varicella-zoster virus, Human herpesvirus 6, Human herpesvirus 7, Human herpesvirus 8, Variola virus, Vesicular stomatitis virus, Hepatitis A virus, Hepatitis B virus, Hepatitis C virus, Hepatitis D virus, Hepatitis E virus, Rhinovirus, Coronavirus, Influenza virus A, Influenza virus B, Measles virus, Polyomavirus, Human Papilomavirus, Respiratory syncytial virus, Adenovirus, Coxsackie virus, Dengue virus, Mumps virus, Poliovirus, Rabies virus, Rous sarcoma virus, Yellow fever virus, Ebola virus, Marburg virus, Lassa fever virus, Eastern Equine Encephalitis virus, Japanese Encephalitis virus, St. Louis Encephalitis virus, Murray Valley fever virus, West Nile virus, Rift Valley fever virus, Rotavirus A, Rotavirus B, Rotavirus C, Sindbis virus, Simian Immunodeficiency cirus, Human T-cell Leukemia virus type-1, Hantavirus, Rubella virus, Simian

Immunodeficiency virus, Human Immunodeficiency virus type-1, and Human Immunodeficiency virus type-2.

38. The method of claim 35, wherein the infectious disease is a fungal infection selected from the group of fungi consisting of *Candida albicans, Cryptococcus neoformans, Histoplama capsulatum, Aspergillus fumigatus, Coccidiodes immitis, Paracoccidiodes brasiliensis, Blastomyces dermitidis, Pneomocystis carnii, Penicillium marneffi, and Alternaria alternata.*

39. The method of claim 35, wherein the infectious disease is a parasitic infection selected from the group of parasites consisting of *Toxoplasma gondii, Plasmodium falciparum, Plasmodium vivax, Plasmodium malariae,* other *Plasmodium* species., *Trypanosoma brucei, Trypanosoma cruzi, Leishmania major,* other *Leishmania* species., *Schistosoma mansoni,* other *Schistosoma* species., and *Entamoeba histolytica.*

40. The method of claim 29, further comprising making a diagnosis based on the pattern of gene expression on the microarray, wherein a pattern matching one associated with a condition indicates the subject has the condition.

41. A method of identifying genes involved in a condition associated with PNI activity comprising obtaining tissue samples from subjects with the condition and a control population, isolating the RNA, analyzing the RNA using a PNI microarray, and comparing the expression of genes in the subjects with the condition to the control population, wherein gene expression present in 70% or more of the subjects, but in fewer than 20% of the controls indicates genes involved in a condition associated with PNI activity.

42. The method of claim 41, wherein the tissue sample is blood.

43. The method of claim 41, wherein the subject is a mammal.

44. The method of claim 42, wherein the mammal is a human.

45. The method of claim 42, wherein the mammal is a mouse.

46. A method of classifying a condition as being associated with PNI activity comprising obtaining tissue samples from subjects with the condition and a control population, isolating the RNA, analyzing the RNA using a PNI microarray, and comparing the expression of genes in the subjects with the condition to the control population, wherein conditions that result in gene expression present in 70% or more of

the subjects, but in fewer than 20% of the controls indicates a condition associated with PNI activity.

5

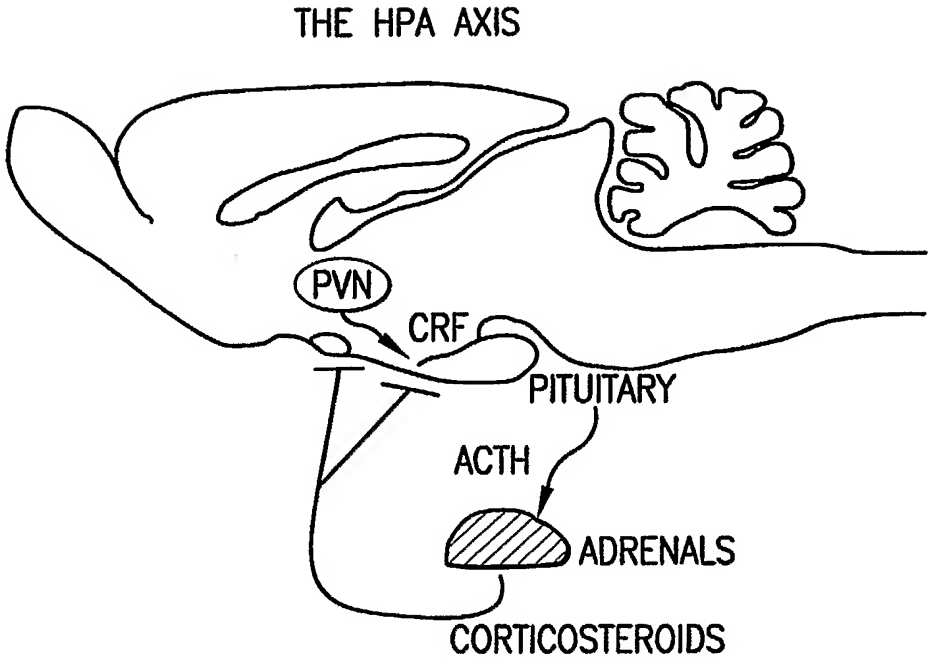

THE HPA AXIS
PVN
CRF
PITUITARY
ACTH
ADRENALS
CORTICOSTEROIDS

FIG. 1

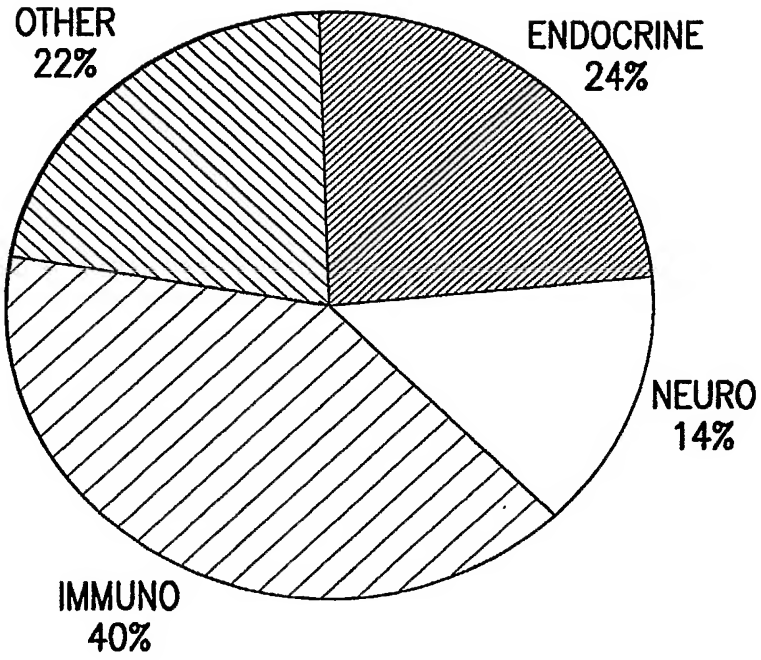


FIG.2

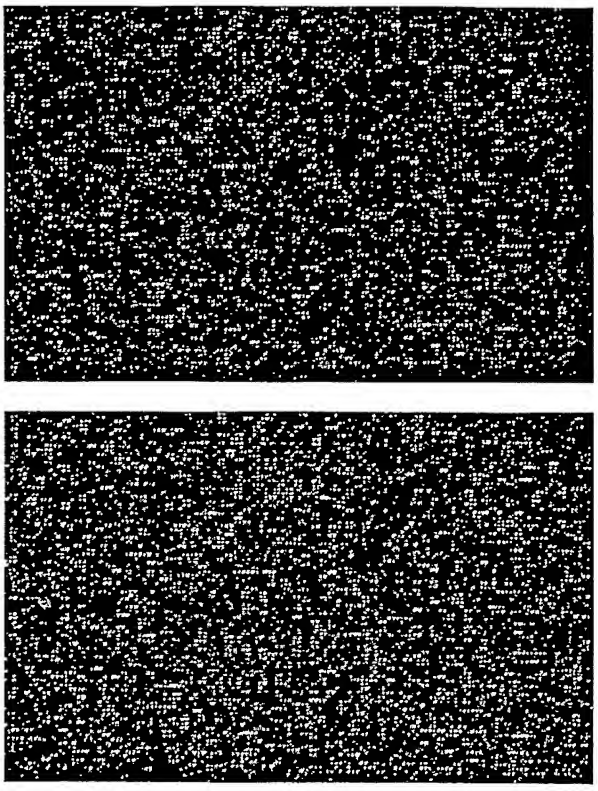


FIG.3A

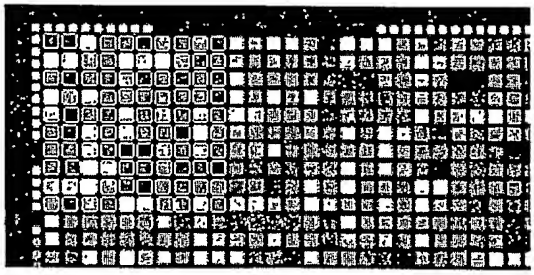


FIG.3B

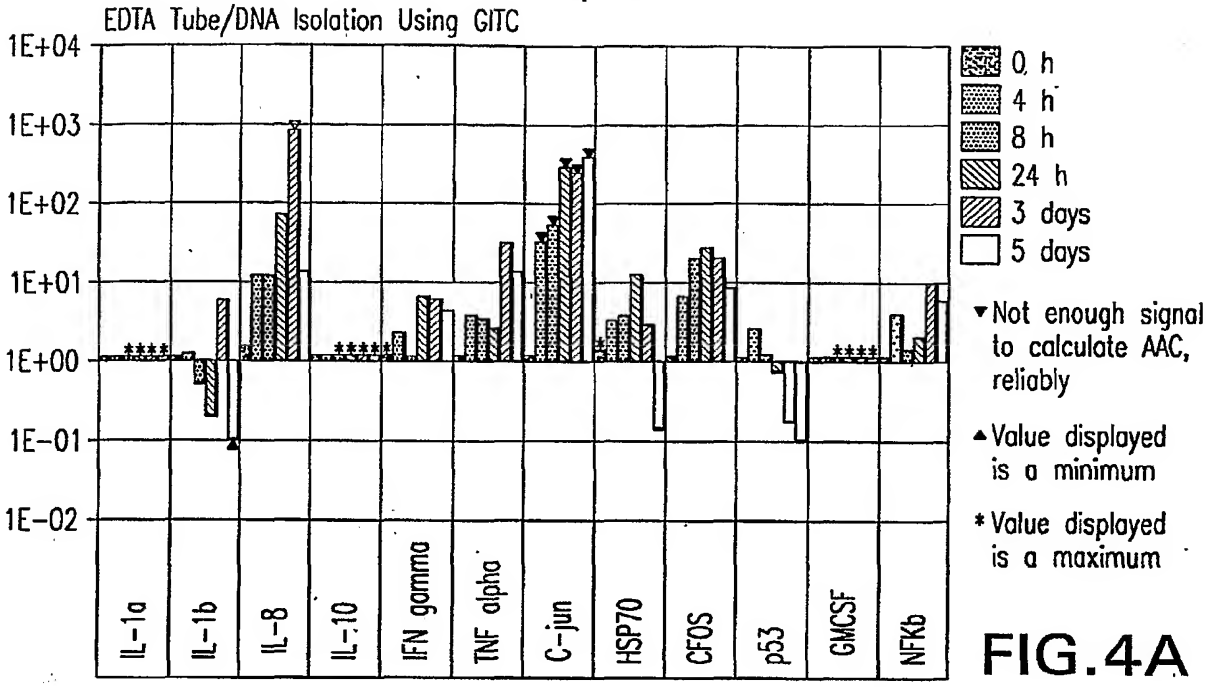


FIG.4A

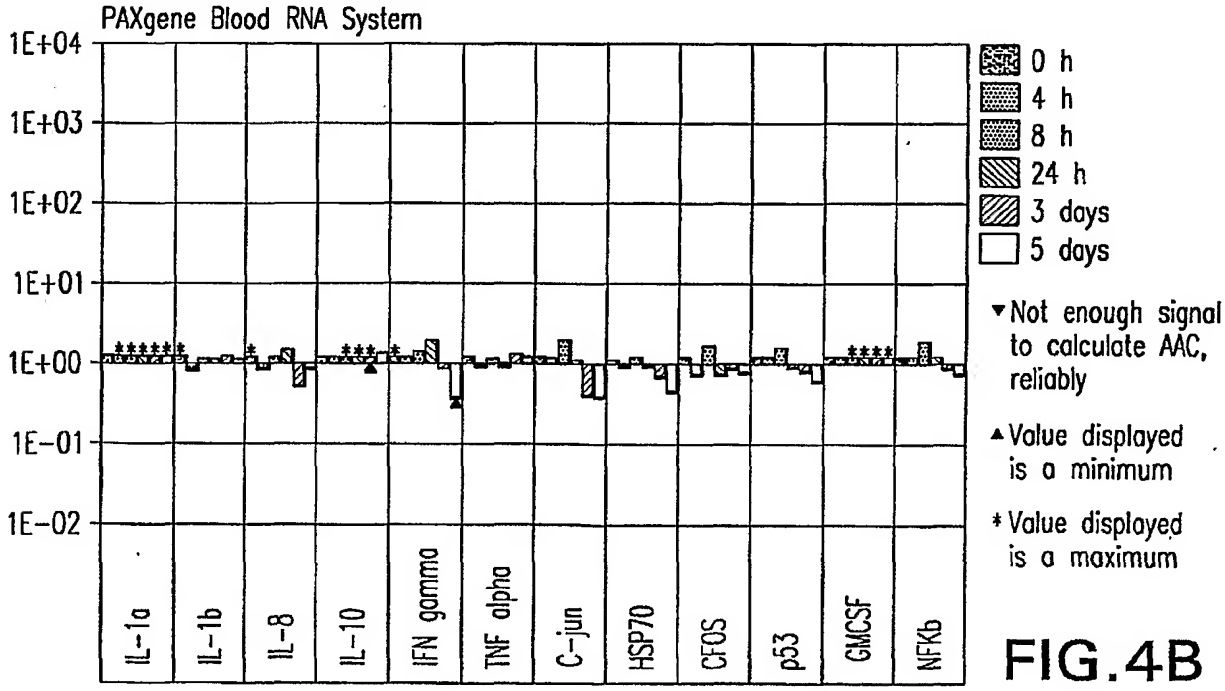


FIG.4B

Blood was collected and RNA was isolated using either A standard methods (collection in EDTA tubes; no stabilization; RNA isolation using a guanidinium-based method), or B the PAXgene Blood RNA System (for RNA stabilization and isolation). The graphs show changes in expression of 12 genes after blood collection, measured using real-time RT-PCR. (Data kindly provided by Source Precision Medicine, Boulder, Colorado).

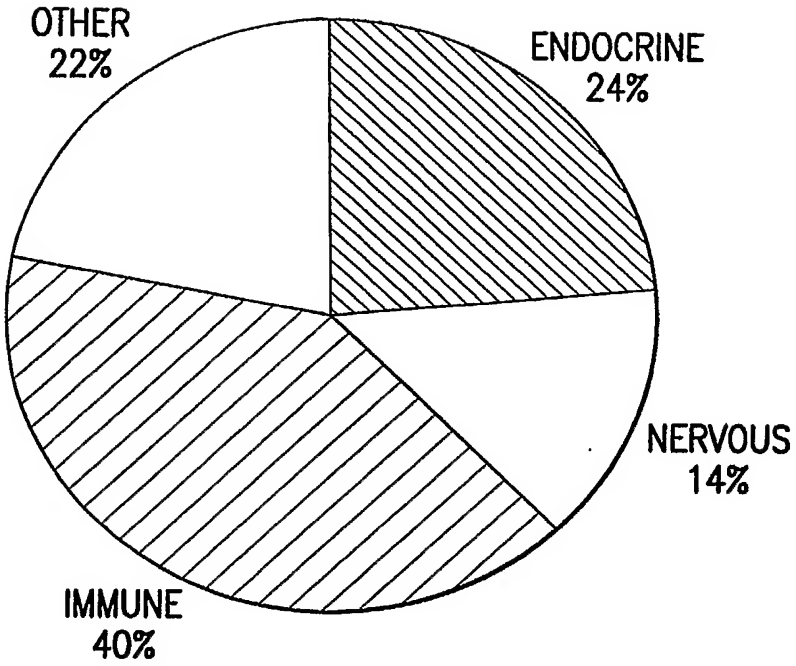
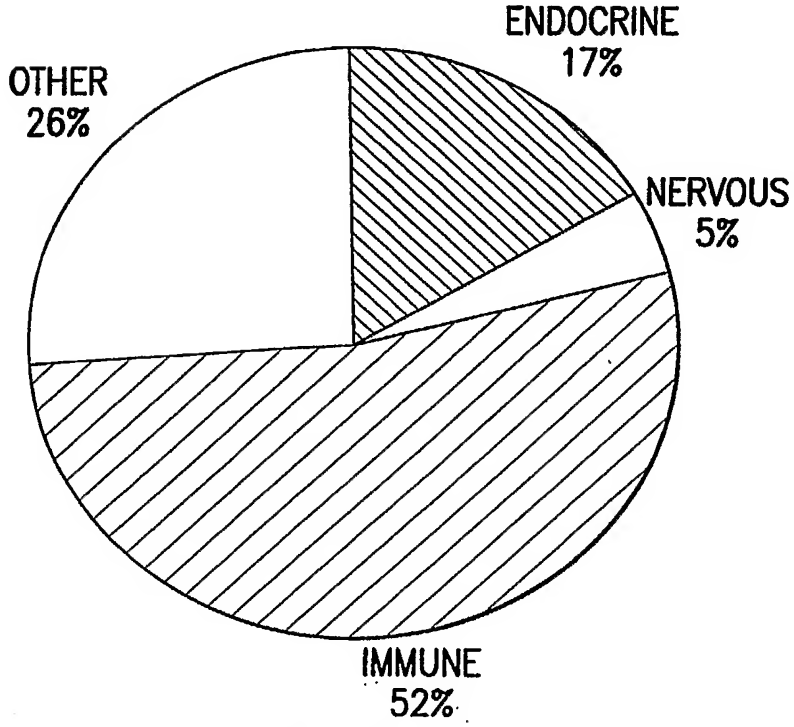

OTHER
22%
ENDOCRINE
24%
NERVOUS
14%
IMMUNE
40%

FIG.5A


ENDOCRINE
17%
OTHER
26%
NERVOUS
5%
IMMUNE
52%

SEE
FIG.6-2

Many psychoneuroendocrinimmune genes are expressed in peripheral blood
A) All PNI Genes analyzed
Endocrine 15%
Immune 43%
Neuronal 16%
Other 26%
B) PNI Genes with ESTs in blood
Endocrine 10%
Immune 55%
Neuronal 5%
Other 30%
C) PNI Genes expressed in PBMCs
Endocrine 17%
Immune 46%
Neuronal 13%
Other 22%
A) 1451 genes were selected for analysis either because they have known or suspected roles in endocrine (24%), nervous (14%), or immune (40%) systems or because changes in their regulation would affect at least one of those systems (other.22%). B) 505 of the selectedgenes were represented by expressed sewuence tags (ESTs) in a database constructed form nine blood-derived EST libraries. As expected, a large proportion of these were genes encoding immune system proteins (52%), or classified as "other" (26%), but genes encoding (17%) or (5%) nervous system functions were predicted to by detectable in peripheral blood.

FIG.6-1

Category	PNI genes	Found In Blood ESTs	Expression in PBMCs
Endocrine:Hormone Metabolism	79	17	16
Hormone Receptor	95	12	18
Hormones	45	1	10
Regulated by Hormones	28	11	7
Regulates Hormone Activity	53	25	10
Regulates Hormone Expression	18	6	4
Other Neuroendocrine Function	30	12	5
Nervous System : Neurotransmitter	20	0	3
Neurotransmitter Metabolism	32	10	8
Neurotransmitter Receptor	100	3	27
Regulated by Neurotransmitters	2	1	1
Regulates Neurotransmitter Activity	51	10	13
Regulates Neurotransmitter Expression	1	0	0
Immune System : Apoptosis	40	26	20
Complement Component	29	7	7
Cytokine or Chemokine Receptors	90	38	28
Cytokines and Chemokines	108	31	31
MHC/HLA	18	17	4
Regulated by Cytokines or chemokines	9	4	0
Regulates Cytokine Activity	20	7	3
T-cell Activation	6	3	2
Other Immune Function	261	134	79
Signal Transduction	55	31	10
Protease Inhibitor	9	4	0
Transcription Factor	92	44	16
Circadian	7	4	1
Regulation of Cell Growth	40	6	13
Growth Factor	26	5	11
Growth Factor Receptor	11	1	3
Heat shock	20	11	6
Stress Response	10	9	2
Homeostasis & Small Molecule transport	32	5	10
Other	10	7	2
Unknown Function	4	3	4
Total	1451	505	374

FIG 6-2

negGENE	negGENE	PER1	PER1	TIMELESS	TIMELESS	CSNK1	CSNK1	negGENE-B	negGENE-B
NCOA1	NCOA1	PDGFRB	PDGFRB	IL2RA	IL2RA	SOD2	SOD2	CLOCK	CLOCK
STAT1	STAT1	CDK4	CDK4	TGFB1	TGFB1	LTB	LTB	FCGR1A	FCGR1A
IFNG	IFNG	ITGA2	ITGA2	PTGDS	PTGDS	GBP4	GBP4	VAMP2	VAMP2
GADD45B	GADD45B	IL6R	IL6R	C2	C2	E2IG5	E2IG5	TLR2	TLR2
DUSP14	DUSP14	SOD1	SOD1	CYP27B1	CYP27B1	LAT	LAT	PDGFC	PDGFC
IFIT4	IFIT4	NR1	NR1	ICOS	ICOS	GABBR1	GABBR1	NRG1	NRG1
negGENE-B	negGENE-B	TFRC	TFRC	GABARAP	GABARAP	PER1 ANTI	PER1 ANTI	negGENE	negGENE

FIG.7

FIG.8

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	343 12.26		108 27.37		109 39.53		110 22.42		342 41.59		111 82.51		112 86.93		113 39.91		114 93.79		115 59.25		116 58.23		117 37.08	
B																								
C	118 52.97		119 19.45		120 21.14		121 19.05		122 35.72		123 47.07		124 17.75		125 33.95		126 9.72		127 19.18		128 41.53		129 9.62	
D																								
E	130 7.54		131 6.34		132 7.68		133 17.92		134 7.31		135 7.26		136 13.43		137 103.5		138 10.13		139 10.24		140 6.85		342 41.59	
F																								
G	141 41.21		142 6.86		344 19.64		343 12.26																	
H																								
I																								
J																								
K																								
L																								
M																								
N																								
O																								
P																								

syn#	oligo id	A	G	C	T	mer	NH2	MW	ext coef	OD	µM	µg/ul	vol	#pmol	5000 pmol	1500 pmol
306108	PER1	17	17	15	11	60	0	18543	662300	0.36	54.81	1.02	300	16442.70	91.23	27.37
306109	TIMELESS	14	9	25	12	60	0	18166	606100	0.23	37.95	0.69	300	11384.26	131.76	39.53
306110	CSNK1	13	18	15	14	60	0	18532	639700	0.43	66.91	1.24	300	20071.91	74.73	22.42
306111	NCOA1	18	15	17	10	60	0	18472	660100	0.12	18.18	0.34	300	5453.72	275.04	82.51
306112	PDGFRB	10	14	19	17	60	0	18345	603300	0.34	55.69	1.02	300	16708.11	89.78	26.93
306113	IL2RA	21	17	10	12	60	0	18654	694400	0.26	37.59	0.70	300	11275.92	133.03	39.91
306114	SOD2	20	15	20	5	60	0	18445	669000	0.11	15.99	0.30	300	4798.21	312.62	93.79
306115	CLOCK	18	14	12	16	60	0	18522	663600	0.17	25.32	0.47	300	7594.94	197.50	59.25
306116	STAT1	20	18	13	9	60	0	18625	687100	0.18	25.76	0.48	300	7728.13	194.10	58.23
306117	CDK4	10	20	12	18	60	0	18600	630400	0.26	40.45	0.75	300	12135.15	123.61	37.08
306118	TGFB1	16	17	17	10	60	0	18504	653300	0.19	28.32	0.52	300	8495.33	176.57	52.97
306119	LTB	4	18	17	21	60	0	18421	579500	0.45	77.14	1.42	300	23140.64	64.82	19.45
306120	FCGR1A	12	16	14	18	60	0	18488	628600	0.45	70.95	1.31	300	21285.40	70.47	21.14
306121	IFNG	6	14	16	24	60	0	18354	581600	0.46	78.75	1.45	300	23624.48	63.49	19.05
306122	ITGA2	16	15	13	16	60	0	18514	652500	0.27	41.99	0.78	300	12597.70	119.07	35.72
306123	PTGDS	11	22	14	13	60	0	18629	640200	0.20	31.87	0.59	300	9559.51	156.91	47.07
306124	GBP4	14	13	18	15	60	0	18371	627200	0.27	84.503	1.55	300	25350.77	59.17	17.75
306125	VAMP2	16	12	24	8	60	0	18274	629200	0.14	44.183	0.81	300	13254.93	113.17	33.95
306126	GADD45B	12	22	14	12	60	0	18638	646600	0.50	154.35	2.88	300	46303.74	32.39	9.72
306127	IL6R	13	23	15	9	60	0	18657	654700	0.26	78.204	1.46	300	23461.13	63.94	19.18
306128	C2	15	18	21	7	61	0	18764	653400	0.12	36.119	0.68	300	10835.63	138.43	41.53
306129	E2IG5	13	20	11	17	61	0	18946	659600	0.51	155.85	2.95280	300	46755.61	32.08	9.62
306130	TLR2	13	12	19	17	61	0	18626	625200	0.62	198.98	3.70616	300	59692.90	25.13	7.54
306131	DUSP14	12	12	21	16	61	0	18587	616200	0.73	236.61	4.39792	300	70983.45	21.13	6.34

FIG.9-1

206132	SOD1	19	21	10	11	61	0	19040	702300	0.69	195.36	3.71969	300	58607.43	25.59	7.68
206133	CYP27B1	14	15	24	9	62	0	18939	642800	0.27	83.6963	1.58515	300	25108.90	59.74	17.92
206134	LAT	16	14	20	12	62	0	18992	657800	0.68	205.229	3.89780	300	61568.87	24.36	7.31
206135	PDGFC	23	14	13	13	63	0	19465	720400	0.74	206.551	4.02049	300	61965.57	24.21	7.26
206136	IFIT4	21	16	15	11	63	0	19467	711000	0.40	111.673	2.17392	300	33502.11	44.77	13.43
206137	NR1	11	17	16	19	63	0	19387	648700	0.05	14.4905	0.28092	300	4347.16	345.05	103.52
206138	ICOS	24	14	13	14	65	0	20082	744200	0.55	148.078	2.97374	300	44423.54	33.77	10.13
206139	GABBR1	15	20	14	16	65	0	20136	703300	0.52	146.452	2.94897	300	43935.73	34.14	10.24
206140	NRG1	16	12	17	20	65	0	19900	681800	0.75	218.832	4.35476	300	65649.75	22.85	6.85
206141	TFRC	17	18	15	15	65	0	20089	708800	0.13	36.3995	0.73123	300	10919.86	137.36	41.21
206142	GABARAP	20	15	16	14	65	0	20026	717700	0.79	218.754	4.38080	300	65626.31	22.86	6.86
207342	NEG GENE-B	14	21	7	18	60	0	18736	665500	0.12	36.0631	0.67568	900	32456.80	138.65	41.59
207343	NEG GENE	14	21	7	18	60	0	18736	665500	0.41	122.314	2.29168	300	36694.21	40.88	12.26
207344	PER1 ANTI	11	15	17	17	60	0	18409	615300	0.24	76.3855	1.40617	300	22915.65	65.46	19.64

FIG.9-2

Gene Abbreviation	Accession #	Category	larger category
PER3	NM_016831	Circadian	other
PTGIS	NM_000961	Endocrine: Hormone Metabolism	endocrine
POR	NM_000941	Endocrine: Hormone Metabolism	endocrine
AKR1C3	NM_003739	Endocrine: Hormone Metabolism	endocrine
HSD17B8	NM_014234	Endocrine: Hormone Metabolism	endocrine
CYP1B1	NM_000104	Endocrine: Hormone Metabolism	endocrine
CYP2S1	NM_030622	Endocrine: Hormone Metabolism	endocrine
EBAS1 vIXS-I	NM_001061	Endocrine: Hormone Metabolism	endocrine
CYP4A11	NM_000778	Endocrine: Hormone Metabolism	endocrine
CYP2F1	NM_000774	Endocrine: Hormone Metabolism	endocrine
CYP2B6	NM_000767	Endocrine: Hormone Metabolism	endocrine
CYP2C8 vHp1-2	NM_030878	Endocrine: Hormone Metabolism	endocrine
CYP2C8 vHp1-1	NM_000770	Endocrine: Hormone Metabolism	endocrine
CYP8B1	NM_004391	Endocrine: Hormone Metabolism	endocrine
HSDH4A1	NM_003748	Endocrine: Hormone Metabolism	endocrine
CYP2C18	NM_000772	Endocrine: Hormone Metabolism	endocrine
CYP17	NM_000102	Endocrine: Hormone Metabolism	endocrine
THRB	NM_000461	Endocrine: Hormone Receptor	endocrine
ESR2	NM_001437	Endocrine: Hormone Receptor	endocrine
NR4	NM_018949	Endocrine: Hormone Receptor	endocrine
NRMC1	NM_006667	Endocrine: Hormone Receptor	endocrine
PGR	NM_000926	Endocrine: Hormone Receptor	endocrine
VIPR1	NM_004624	Endocrine: Hormone Receptor	endocrine
AC5R	NM_005913	Endocrine: Hormone Receptor	endocrine
NARA	NM_000964	Endocrine: Hormone Receptor	endocrine
MC1R	NM_002386	Endocrine: Hormone Receptor	endocrine
VPR1B	NM_000707	Endocrine: Hormone Receptor	endocrine

	percent	count
Endocrine	17.3%	65
Immune	46.4%	174
Neuronal	13.9%	52
Other	22.1%	83

FIG.10-1

ESRRA	NM_004451	Endocrine: Hormone Receptor	endocrine
ESRRB	NM_004452	Endocrine: Hormone Receptor	endocrine
INSR	NM_000208	Endocrine: Hormone Receptor	endocrine
AR	NM_000044	Endocrine: Hormone Receptor	endocrine
OXTR	NM_000916	Endocrine: Hormone Receptor	endocrine
EMR3 v1	NM_032571	Endocrine: Hormone Receptor	endocrine
GPR81	NM_032554	Endocrine: Hormone Receptor	endocrine
ADCYAP1R1	NM_001118	Endocrine: Hormone Receptor	endocrine
UCN	NM_003353	Endocrine: Hormones	endocrine
RLN2 v2	NM_005059	Endocrine: Hormones	endocrine
GH2 v3	NM_022558	Endocrine: Hormones	endocrine
GH1 v1	NM_000515	Endocrine: Hormones	endocrine
SPC	NM_053049	Endocrine: Hormones	endocrine
INS	NM_000207	Endocrine: Hormones	endocrine
ADM	NM_001124	Endocrine: Hormones	endocrine
GH2 v1	NM_002059	Endocrine: Hormones	endocrine
GHRH	NM_021081	Endocrine: Hormones	endocrine
GH2 v2	NM_022557	Endocrine: Hormones	endocrine
GREB1 vo	NM_014668	Endocrine: Regulated by Hormones	endocrine
NRGN	NM_006176	Endocrine: Regulated by Hormones	endocrine
CDKN1C	NM_000076	Endocrine: Regulated by Hormones	endocrine
GHITM	NM_014394	Endocrine: Regulated by Hormones	endocrine
INSIG1	NM_005542	Endocrine: Regulated by Hormones	endocrine
SFRS5	NM_006925	Endocrine: Regulated by Hormones	endocrine
CDK4 v1	NM_000075	Endocrine: Regulated by Hormones	endocrine
SHBG	NM_001040	Endocrine: Regulates Hormone Activity	endocrine
RGS19IP1	NM_005716	Endocrine: Regulates Hormone Activity	endocrine
COASTER	NM_015555	Endocrine: Regulates Hormone Activity	endocrine
NCOA5	NM_020967	Endocrine: Regulates Hormone Activity	endocrine
NCOA4	NM_005437	Endocrine: Regulates Hormone Activity	endocrine
TRHDE	NM_013381	Endocrine: Regulates Hormone Activity	endocrine
SNX4	NM_003794	Endocrine: Regulates Hormone Activity	endocrine

FIG.10-2

NCOA6IP	NM_024831	Endocrine: Regulates Hormone Activity	endocrine
MME v1	NM_000902	Endocrine: Regulates Hormone Activity	endocrine
CREBBP	NM_004380	Endocrine: Regulates Hormone Activity	endocrine
PCSK2	NM_002594	Endocrine: Regulates Hormone Expression	endocrine
PC v1	NM_000920	Endocrine: Regulates Hormone Expression	endocrine
IPF1	NM_000209	Endocrine: Regulates Hormone Expression	endocrine
KLK2	NM_005551	Endocrine: Regulates Hormone Expression	endocrine
NRG1vSMDF	NM_013959	Growth Factor	other
IGF1	NM_000618	Growth Factor	other
EGF	NM_001963	Growth Factor	other
TGFB3	NM_003239	Growth Factor	other
FIGF	NM_004469	Growth Factor	other
MDK	NM_002391	Growth Factor	other
NMB	NM_021077	Growth Factor	other
PDGFA v2	NM_033023	Growth Factor	other
PDGFC	NM_016205	Growth Factor	other
PTN	NM_002825	Growth Factor	other
PDGFA v1	NM_002607	Growth Factor	other
NMBR	NM_002511	Growth Factor Receptor	other
ERBB3	NM_001982	Growth Factor Receptor	other
PDGFRB	NM_002609	Growth Factor Receptor	other
HSPA9B	NM_004134	Heat shock	other
HSPB2	NM_001541	Heat shock	other
HSPB7	NM_014424	Heat shock	other
HSPA5	NM_005347	Heat shock	other
HARC	NM_017913	Heat shock	other
TRPV2	NM_016113	Heat shock	other
TRPM2	NM_003307	Homeostasis & Small Molecule transport	other
SCN5A	NM_000335	Homeostasis & Small Molecule transport	other
SCN7A	NM_002976	Homeostasis & Small Molecule transport	other
SLC15A2	NM_021082	Homeostasis & Small Molecule transport	other

FIG.10-3

SLC25A3 vB	NM_002635	Homeostasis & Small Molecule transport	other
VIAAT	NM_080552	Homeostasis & Small Molecule transport	other
CACNA1B	NM_000718	Homeostasis & Small Molecule transport	other
SLC29A1	NM_004955	Homeostasis & Small Molecule transport	other
SCN1A	NM_006920	Homeostasis & Small Molecule transport	other
SCN3A	NM_006922	Homeostasis & Small Molecule transport	other
CASP10 vB	NM_032974	Immune: Apoptosis	immune
CASP7 vD	NM_033338	Immune: Apoptosis	immune
CASP7 vb	NM_033340	Immune: Apoptosis	immune
LRDD v2	NM_018494	Immune: Apoptosis	immune
CASP7 va	NM_001227	Immune: Apoptosis	immune
CASP7 vc	NM_033339	Immune: Apoptosis	immune
CASP8 vA	NM_001228	Immune: Apoptosis	immune
CFLAR	NM_003879	Immune: Apoptosis	immune
MYD88	NM_002468	Immune: Apoptosis	immune
FADD	NM_003824	Immune: Apoptosis	immune
CASP8 vE	NM_033358	Immune: Apoptosis	immune
CARD10	NM_014550	Immune: Apoptosis	immune
BCL2L2	NM_004050	Immune: Apoptosis	immune
CASP8 vD	NM_033357	Immune: Apoptosis	immune
BAX vE	NM_138764	Immune: Apoptosis	immune
ICEBERG	NM_021571	Immune: Apoptosis	immune
CASP8 vC	NM_033356	Immune: Apoptosis	immune
DAP	NM_004394	Immune: Apoptosis	immune
MAGED1	NM_006986	Immune: Apoptosis	immune
CASP8 vB	NM_033355	Immune: Apoptosis	immune
MASP1 v2	NM_139125	Immune: Complement Component	immune
ITGAM	NM_000632	Immune: Complement Component	immune
C3	NM_000064	Immune: Complement Component	immune

FIG.10-4

C4BPB	NM_000716	Immune: Complement Component	immune
CR2	NM_001877	Immune: Complement Component	immune
C1S	NM_001734	Immune: Complement Component	immune
C1R	NM_001733	Immune: Complement Component	immune
TNFRSF10A	NM_003844	Immune: Cytokine/Chemokine Receptors	immune
IL6R	NM_000565	Immune: Cytokine/Chemokine Receptors	immune
CCL25 v2	NM_148888	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF10B v1	NM_003842	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF17	NM_001192	Immune: Cytokine/Chemokine Receptors	immune
IL12RB2	NM_001559	Immune: Cytokine/Chemokine Receptors	immune
IL-23R	NM_144701	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF6 v1	NM_000043	Immune: Cytokine/Chemokine Receptors	immune
IL3RA	NM_002183	Immune: Cytokine/Chemokine Receptors	immune
IL8RB	NM_001557	Immune: Cytokine/Chemokine Receptors	immune
GPR30	NM_001505	Immune: Cytokine/Chemokine Receptors	immune
CX3CR1	NM_001337	Immune: Cytokine/Chemokine Receptors	immune
IL22RA2	NM_052962	Immune: Cytokine/Chemokine Receptors	immune
IL22R	NM_021258	Immune: Cytokine/Chemokine Receptors	immune
IL13RA2	NM_000640	Immune: Cytokine/Chemokine Receptors	immune
HM74	NM_006018	Immune: Cytokine/Chemokine Receptors	immune
CCR8	NM_005201	Immune: Cytokine/Chemokine Receptors	immune
CCR4	NM_005508	Immune: Cytokine/Chemokine Receptors	immune
IL17BR	NM_018725	Immune: Cytokine/Chemokine Receptors	immune
CSF2RA v1	NM_006140	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF19L	NM_032871	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF13B	NM_012452	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF10C	NM_003841	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF10D	NM_003840	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF11B	NM_002546	Immune: Cytokine/Chemokine Receptors	immune

FIG.10-5

IL2RG	NM_000206	Immune: Cytokine/Chemokine Receptors	immune
IL-17RC	NM_032732	Immune: Cytokine/Chemokine Receptors	immune
TNFRSF11A	NM_003839	Immune: Cytokine/Chemokine Receptors	immune
IL16	NM_004513	Immune: Cytokines/Chemokines	immune
CCL2	NM_002982	Immune: Cytokines/Chemokines	immune
XCL2	NM_003175	Immune: Cytokines/Chemokines	immune
CXCL16	NM_022059	Immune: Cytokines/Chemokines	immune
SCYE1	NM_004757	Immune: Cytokines/Chemokines	immune
TNFSF12 v1	NM_003809	Immune: Cytokines/Chemokines	immune
CCL22	NM_002990	Immune: Cytokines/Chemokines	immune
TNFSF13	NM_003808	Immune: Cytokines/Chemokines	immune
TNFSF11 v2	NM_033012	Immune: Cytokines/Chemokines	immune
IL11	NM_000641	Immune: Cytokines/Chemokines	immune
CCL19	NM_006274	Immune: Cytokines/Chemokines	immune
CCL23 v1	NM_005064	Immune: Cytokines/Chemokines	immune
CCL24	NM_002991	Immune: Cytokines/Chemokines	immune
CXCL13	NM_006419	Immune: Cytokines/Chemokines	immune
N-PAC	NM_032569	Immune: Cytokines/Chemokines	immune
IL21	NM_021803	Immune: Cytokines/Chemokines	immune
IL17F	NM_052872	Immune: Cytokines/Chemokines	immune
IL17E	NM_022789	Immune: Cytokines/Chemokines	immune
CXCL11	NM_005409	Immune: Cytokines/Chemokines	immune
CXCL10	NM_001565	Immune: Cytokines/Chemokines	immune
CCL16	NM_004590	Immune: Cytokines/Chemokines	immune
CCL13	NM_005408	Immune: Cytokines/Chemokines	immune
CCL1	NM_002981	Immune: Cytokines/Chemokines	immune
IL14	XM_170924	Immune: Cytokines/Chemokines	immune
IL1F8	NM_014438	Immune: Cytokines/Chemokines	immune
XCL1	NM_002995	Immune: Cytokines/Chemokines	immune
IL13	NM_002188	Immune: Cytokines/Chemokines	immune
IL1F9	NM_019618	Immune: Cytokines/Chemokines	immune

FIG. 10-6

IL3	NM_000588	Immune: Cytokines/Chemokines	immune
OSMR	NM_003999	Immune: Cytokines/Chemokines	immune
YARS	NM_003680	Immune: Cytokines/Chemokines	immune
HLA-A	NM_002116	Immune: MHC/HLA	immune
HLA-DPA1	NM_033554	Immune: MHC/HLA	immune
HLA-DRB4	NM_021983	Immune: MHC/HLA	immune
MHC2TA	NM_000246	Immune: MHC/HLA	immune
IFNAR2	NM_000874	Immune: Other Immune Function	immune
CD19	NM_001770	Immune: Other Immune Function	immune
TBK1	NM_013254	Immune: Other Immune Function	immune
LRBA	NM_006726	Immune: Other Immune Function	immune
MX1	NM_002462	Immune: Other Immune Function	immune
IFITM2	NM_006435	Immune: Other Immune Function	immune
FUS	NM_004960	Immune: Other Immune Function	immune
IFITM1	NM_003641	Immune: Other Immune Function	immune
ABCA7 v1	NM_019112	Immune: Other Immune Function	immune
KLRD1 v1	NM_002262	Immune: Other Immune Function	immune
ICAM1	NM_000201	Immune: Other Immune Function	immune
HRH1	NM_000861	Immune: Other Immune Function	immune
EAT2	NM_053282	Immune: Other Immune Function	immune
CYSLTR1	NM_006639	Immune: Other Immune Function	immune
DCNP1	NM_130848	Immune: Other Immune Function	immune
FCGR3A	NM_000569	Immune: Other Immune Function	immune
BTK	NM_000061	Immune: Other Immune Function	immune
LTB4R	NM_000752	Immune: Other Immune Function	immune
IFNA1	NM_024013	Immune: Other Immune Function	immune
IFNA2	NM_000605	Immune: Other Immune Function	immune
IFNA4	NM_021068	Immune: Other Immune Function	immune
IFNA6	NM_021002	Immune: Other Immune Function	immune
EBI3	NM_005755	Immune: Other Immune Function	immune

FIG.10-7

IFNGR1	NM_000416	Immune: Other Immune Function	immune
ITGAL	NM_002209	Immune: Other Immune Function	immune
FCGR1A	NM_000566	Immune: Other Immune Function	immune
PRV1	NM_020406	Immune: Other Immune Function	immune
ITGAX	NM_000887	Immune: Other Immune Function	immune
AIM2	NM_004833	Immune: Other Immune Function	immune
CD1E	NM_030893	Immune: Other Immune Function	immune
CD3D	NM_000732	Immune: Other Immune Function	immune
CD8A	NM_001768	Immune: Other Immune Function	immune
EAF1	NM_033083	Immune: Other Immune Function	immune
IFI16	NM_005531	Immune: Other Immune Function	immune
CD3Z	NM_000734	Immune: Other Immune Function	immune
IFNGR2	NM_005534	Immune: Other Immune Function	immune
FCGR3B	NM_000570	Immune: Other Immune Function	immune
TLR2	NM_003264	Immune: Other Immune Function	immune
TRIM	NM_016388	Immune: Other Immune Function	immune
PLA2G4A	NM_024420	Immune: Other Immune Function	immune
PTGER3	NM_000957	Immune: Other Immune Function	immune
PTGER4	NM_000958	Immune: Other Immune Function	immune
HAVCR2	NM_032782	Immune: Other Immune Function	immune
PTPN9	NM_002833	Immune: Other Immune Function	immune
FCER1G	NM_004106	Immune: Other Immune Function	immune
PTPN7 v3	NM_080589	Immune: Other Immune Function	immune
PTPN7 v2	NM_080588	Immune: Other Immune Function	immune
IFNA14	NM_002172	Immune: Other Immune Function	immune
ADA	NM_000022	Immune: Other Immune Function	immune
RelA	NM_021975	Immune: Other Immune Function	immune
TLR1	NM_003263	Immune: Other Immune Function	immune
TPT1	NM_003295	Immune: Other Immune Function	immune
TLR10	NM_030956	Immune: Other Immune Function	immune

FIG.10-8

FKBP2 v1	NM_004470	Immune: Other Immune Function	immune
FKBP2 v2	NM_057092	Immune: Other Immune Function	immune
FKBP1A v12B	NM_000801	Immune: Other Immune Function	immune
FKBP1A v12A	NM_054014	Immune: Other Immune Function	immune
TIMP2	NM_003255	Immune: Other Immune Function	immune
PTCRA	NM_138296	Immune: Other Immune Function	immune
PTPN7 v1	NM_002832	Immune: Other Immune Function	immune
HAL	NM_002108	Immune: Other Immune Function	immune
IRF4	NM_002460	Immune: Other Immune Function	immune
SYK	NM_003177	Immune: Other Immune Function	immune
PTGIR	NM_000960	Immune: Other Immune Function	immune
MMP25	NM_022718	Immune: Other Immune Function	immune
SPAP1	NM_138738	Immune: Other Immune Function	immune
LAT	NM_014387	Immune: Other Immune Function	immune
PRKRIR	NM_004705	Immune: Other Immune Function	immune
ICOS	NM_012092	Immune: Other Immune Function	immune
IFI35	NM_005533	Immune: Other Immune Function	immune
LST1	NM_007161	Immune: Other Immune Function	immune
LAIR1 vB	NM_021706	Immune: Other Immune Function	immune
LAIR1 vD	NM_021708	Immune: Other Immune Function	immune
MMP1	NM_002421	Immune: Other Immune Function	immune
CIAS1	NM_004895	Immune: Other Immune Function	immune
DEFA4	NM_001925	Immune: Other Immune Function	immune
IFNA21	NM_002175	Immune: Other Immune Function	immune
IFNA16	NM_002173	Immune: Other Immune Function	immune
LAIR1 vA	NM_002287	Immune: Other Immune Function	immune
BRE	NM_004899	Immune: Regulates Cytokine Activity	immune
TLR6	NM_006068	Immune: Regulates Cytokine Activity	immune
CLEC2	NM_016509	Immune: Regulates Cytokine Activity	immune
DPP8 v2	NM_017743	Immune: T-cell Activation	immune

FIG. 10-9

DPP8 v1	NM_130434	Immune: T-cell Activation	immune
PNOC	NM_006228	Neuronal: Neurotransmitter	neuronal
TAC3	NM_013251	Neuronal: Neurotransmitter	neuronal
NPPA	NM_006172	Neuronal: Neurotransmitter	neuronal
MAOA	NM_000240	Neuronal: Neurotransmitter Metabolism	neuronal
TH	NM_000360	Neuronal: Neurotransmitter Metabolism	neuronal
COMT vMB	NM_000754	Neuronal: Neurotransmitter Metabolism	neuronal
COMT vS	NM_007310	Neuronal: Neurotransmitter Metabolism	neuronal
NAALAD2	NM_005467	Neuronal: Neurotransmitter Metabolism	neuronal
PC v2	NM_022172	Neuronal: Neurotransmitter Metabolism	neuronal
BBOX1	NM_003986	Neuronal: Neurotransmitter Metabolism	neuronal
RNPEPL1	NM_018226	Neuronal: Neurotransmitter Metabolism	neuronal
TACR2	NM_001057	Neuronal: Neurotransmitter Receptor	neuronal
CHRNA9	NM_017581	Neuronal: Neurotransmitter Receptor	neuronal
CHRNA6	NM_004198	Neuronal: Neurotransmitter Receptor	neuronal
CHRNB4	NM_000750	Neuronal: Neurotransmitter Receptor	neuronal
CHRNB2	NM_000748	Neuronal: Neurotransmitter Receptor	neuronal
NPR2 vL	NM_003995	Neuronal: Neurotransmitter Receptor	neuronal
ADRA1A v2	NM_033303	Neuronal: Neurotransmitter Receptor	neuronal
HTR5A	NM_024012	Neuronal: Neurotransmitter Receptor	neuronal
GABRG3	NM_033223	Neuronal: Neurotransmitter Receptor	neuronal
DRD4	NM_000797	Neuronal: Neurotransmitter Receptor	neuronal
CHRNB3	NM_000749	Neuronal: Neurotransmitter Receptor	neuronal
NPY1R	NM_000909	Neuronal: Neurotransmitter Receptor	neuronal
GABRR1	NM_002042	Neuronal: Neurotransmitter Receptor	neuronal
GABBR1 v2	NM_021903	Neuronal: Neurotransmitter Receptor	neuronal
GABBR1 v3	NM_021904	Neuronal: Neurotransmitter Receptor	neuronal
GRIA3 vFlip	NM_007325	Neuronal: Neurotransmitter Receptor	neuronal
GRIA1 vFlop	NM_000827	Neuronal: Neurotransmitter Receptor	neuronal
GRIA3 vFlop	NM_000828	Neuronal: Neurotransmitter Receptor	neuronal

FIG.10-10

GABRE v3	NM_021987	Neuronal: Neurotransmitter Receptor	neuronal
GABRA3	NM_000808	Neuronal: Neurotransmitter Receptor	neuronal
GRM8	NM_000845	Neuronal: Neurotransmitter Receptor	neuronal
GRM7	NM_000844	Neuronal: Neurotransmitter Receptor	neuronal
GRM4	NM_000841	Neuronal: Neurotransmitter Receptor	neuronal
GABRQ	NM_018558	Neuronal: Neurotransmitter Receptor	neuronal
HTR4	NM_000870	Neuronal: Neurotransmitter Receptor	neuronal
NPR2 vS	NM_000907	Neuronal: Neurotransmitter Receptor	neuronal
Tor1	NM_138327	Neuronal: Neurotransmitter Receptor	neuronal
ADG-90	NM_033069	Neuronal: Regulated by Neurotransmitters	neuronal
DBI	NM_020548	Neuronal: Regulates Neurotransmitter Activity	neuronal
CDV-1	NM_031473	Neuronal: Regulates Neurotransmitter Activity	neuronal
ADRA2C	NM_000683	Neuronal: Regulates Neurotransmitter Activity	neuronal
KLF16	NM_031918	Neuronal: Regulates Neurotransmitter Activity	neuronal
SLC1A1	NM_004170	Neuronal: Regulates Neurotransmitter Activity	neuronal
ARIX	NM_005169	Neuronal: Regulates Neurotransmitter Activity	neuronal
SLC25A20	NM_000387	Neuronal: Regulates Neurotransmitter Activity	neuronal
NTT73	NM_018057	Neuronal: Regulates Neurotransmitter Activity	neuronal
SYN2 v lia	NM_133625	Neuronal: Regulates Neurotransmitter Activity	neuronal
NTT5	NM_014037	Neuronal: Regulates Neurotransmitter Activity	neuronal
GDNF	NM_000514	Neuronal: Regulates Neurotransmitter Activity	neuronal
PPP1R1B	NM_032192	Neuronal: Regulates Neurotransmitter Activity	neuronal
ADRBK1	NM_001619	Neuronal: Regulates Neurotransmitter Activity	neuronal
F3	NM_001993	Other	other
TIMM23	NM_006327	Other	other
SCG2	NM_003469	Other Neuroendocrine Function	other
INSM1	NM_002196	Other Neuroendocrine Function	other
RTN3	NM_006054	Other Neuroendocrine Function	other
SCGB1A1	NM_003357	Other Neuroendocrine Function	other

FIG.10-11

SYP	XM_028505	Other Neuroendocrine Function	other
IGFBP3	NM_000598	Regulation of Cell Growth	other
PTCH	NM_000264	Regulation of Cell Growth	other
WNT2	NM_003391	Regulation of Cell Growth	other
NRG1 vGGF2	NM_013962	Regulation of Cell Growth	other
CDK4 v2	NM_052984	Regulation of Cell Growth	other
MT1H	NM_005951	Regulation of Cell Growth	other
IGFBP5	NM_000599	Regulation of Cell Growth	other
PRSS11	NM_002775	Regulation of Cell Growth	other
NGFRAP1	NM_014380	Regulation of Cell Growth	other
GFRA2	NM_001495	Regulation of Cell Growth	other
MT2A	NM_005953	Regulation of Cell Growth	other
IGFBP2	NM_000597	Regulation of Cell Growth	other
NTF3	NM_002527	Regulation of Cell Growth	other
LCK	NM_005356	Signal Transduction	other
SCAP1	NM_003726	Signal Transduction	other
AIP	NM_003977	Signal Transduction	other
MAP3K8	NM_005204	Signal Transduction	other
TEC	NM_003215	Signal Transduction	other
GFRA3	NM_001496	Signal Transduction	other
RAF1	NM_002880	Signal Transduction	other
MAPK1	NM_002745	Signal Transduction	other
PRKCE	NM_005400	Signal Transduction	other
PRKCB1	NM_002738	Signal Transduction	other
NR1	NM_014434	Stress Response	other
SOD2	NM_000636	Stress Response	other
GIOT-3	NM_016265	Transcription Factor	other
STAT5B	NM_012448	Transcription Factor	other
STAT3 v1	NM_139276	Transcription Factor	other

FIG.10-12

GIOT-2	NM_016264	Transcription Factor	other
ZNF14	NM_021030	Transcription Factor	other
EN2	NM_001427	Transcription Factor	other
TCF8	NM_030751	Transcription Factor	other
MDM2 vA	NM_006878	Transcription Factor	other
STAT3 v2	NM_003150	Transcription Factor	other
CEBPG	NM_001806	Transcription Factor	other
GATA3	NM_002051	Transcription Factor	other
NMI	NM_004688	Transcription Factor	other
RFX2 v1	NM_000635	Transcription Factor	other
IRF5 v1	NM_002200	Transcription Factor	other
RFX2 v2	NM_134433	Transcription Factor	other
IRF3	NM_001571	Transcription Factor	other
NFKBIL2	NM_013432	Unknown Function	other
WSB1 v2	NM_134265	Unknown Function	other
PTPN18	NM_014369	Unknown Function	other
WSB1 v1	NM_015626	Unknown Function	other

FIG.10-13

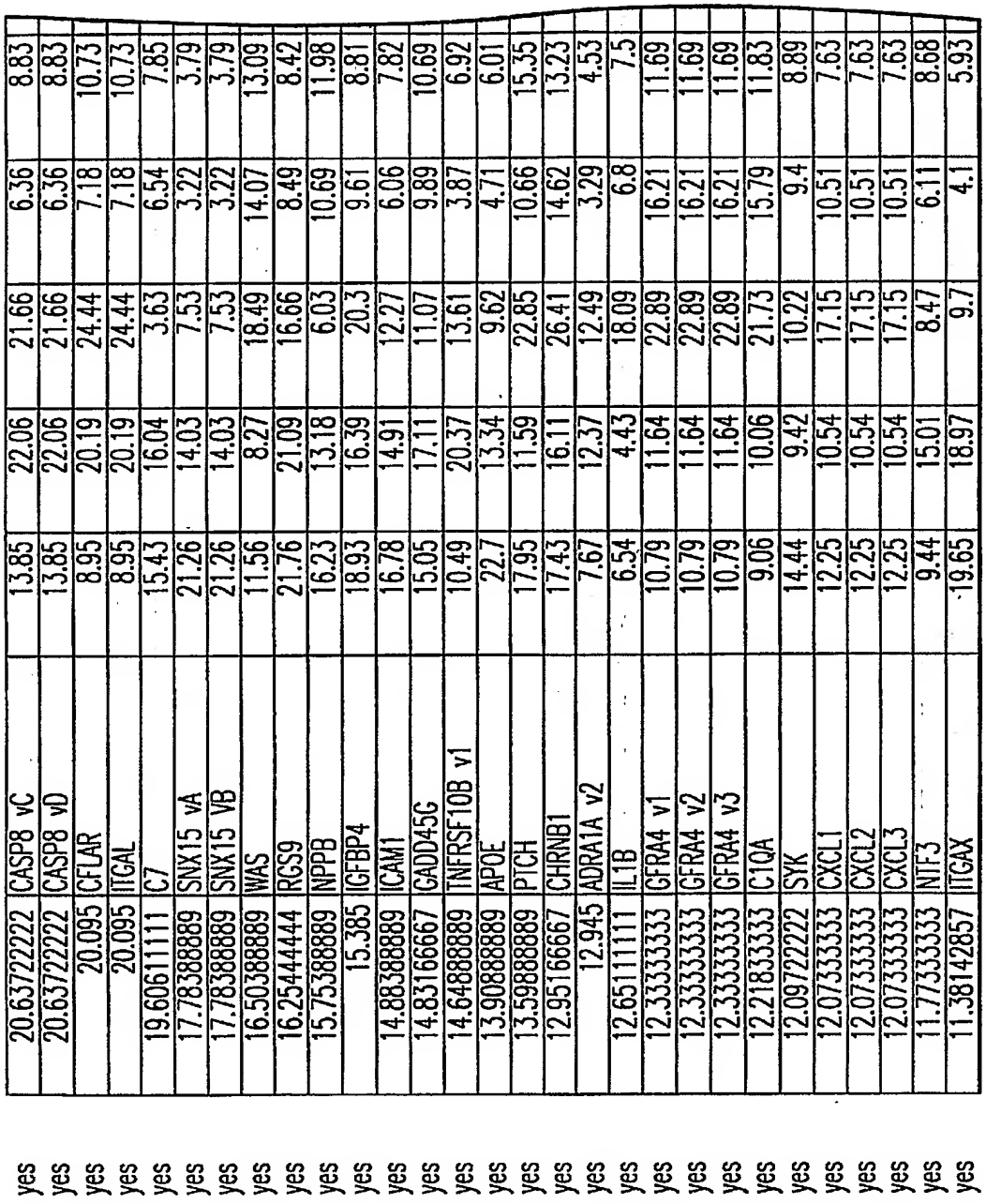
expression detected on MWG 30K arrays	ave	Gene Abbreviation	JJ 8219	JJ 9315	JJ 9479	JJ 8861	JJ 1906
yes	83.23833333	GNRH2	62.76	71.73	104.65	27.37	26.7
yes	68.7794444	MT3	64.71	76.33	69.17	21.25	23.33
yes	57.25388889	E2IG2	58.2	43.79	61.85	21.67	23.04
yes	46.25722222	GRIA3 vFlop	27.46	47.94	63.51	12.36	20.24
yes	46.04111111	SCN2B	42.64	45.97	41.47	22.06	22.87
yes	46.04111111	SCN2B	42.64	45.97	41.47	22.06	22.87
yes	46.04111111	SCN2B	42.64	45.97	41.47	22.06	22.87
yes	46.04111111	SCN2B	42.64	45.97	41.47	22.06	22.87
yes	40.46611111	HK2	38.63	39.87	23.91	17.58	17.44
yes	39.24277778	IL11	19.37	30.68	25.06	10.73	14.82
yes	39.24277778	MHC2TA	19.37	30.68	25.06	10.73	14.82
yes	38.16166667	B7-H3	39.84	41.18	32.63	21.28	21.5
yes	37.27611111	GPR81	19.12	36.2	28.34	7.87	11.91
yes	34.74888889	BCL2L1 v1	40.14	25.85	37.71	13.26	17.64
yes	33.90888889	ODC1	31.01	22.97	36.49	18.33	16.21
yes	29.47444444	NPFF	24.9	17.15	35.38	14.13	21.1
yes	29.39833333	HSPA1A	25.33	17.74	33.27	15.92	19.07
yes	29.39833333	HSPA1B	25.33	17.74	33.27	15.92	19.07
yes	29.30166667	MT1H	20.49	32.75	32.02	8.19	13.09
yes	29.30166667	MT2A	20.49	32.75	32.02	8.19	13.09
yes	28.21166667	WNT10B	22.3	24.09	14.72	15.79	15.82
yes	28.02555556	SLC21A2	22.32	21.61	27.69	18.17	17.02
yes	27.12777778	TMSB4X	23.79	21.04	42.38	18.33	21.64
yes	26.05888889	ALDH1A2	29.68	17.55	7.13	4.57	6.09
yes	25.97	NMB	14.44	11.06	16.3	4.53	4.85
yes	25.72111111	IFIT4	33.24	25.66	28.95	13.12	16.14
yes	24.53333333	CXCL16	12.6	20.49	22.18	7.65	10.39
yes	20.63722222	BAX vE	13.85	22.06	21.66	6.36	8.83
yes	20.63722222	CASP8 vA	13.85	22.06	21.66	6.36	8.83
yes	20.63722222	CASP8 vB	13.85	22.06	21.66	6.36	8.83

FIG.11-1A

JJ 7295	W 202597	W 203445	W 203215	W 204373	W 204118	W 202431	PIF 2057	PIF 2127	PIF 2052	PIF 2160	PIF 2113	PIF 3003
158.59	64.29	65.51	41.32	62.05	64.87	34.56	126.87	118.11	158.83	116.83	124.81	68.44
105.74	50.43	40.96	49.13	80.1	62.75	32.14	111.76	114.3	110.44	73.31	80.31	71.87
110.31	59	52.22	50.45	68.55	68.12	31.66	88.82	63.75	40.69	67.65	52.33	68.47
107.45	57.59	37.18	53.18	41.68	49.17	35.71	49.21	70.63	15.87	22.84	69.65	50.96
58.47	44.63	46.27	41.97	62.86	53.23	29.23	32.86	51.98	59.9	57.14	75.23	39.96
58.47	44.63	46.27	41.97	62.86	53.23	29.23	32.86	51.98	59.9	57.14	75.23	39.96
58.47	44.63	46.27	41.97	62.86	53.23	29.23	32.86	51.98	59.9	57.14	75.23	39.96
58.47	44.63	46.27	41.97	62.86	53.23	29.23	32.86	51.98	59.9	57.14	75.23	39.96
23.98	39.6	27.27	32.36	37.38	31.72	18.34	50.08	86.4	78.31	63.98	45.77	55.77
32.63	57.68	50.04	31.66	32.73	47.38	45.17	70.6	77.41	60.85	10.51	44.72	44.33
32.63	57.68	50.04	31.66	32.73	47.38	45.17	70.6	77.41	60.85	10.51	44.72	44.33
45.07	50.02	43.29	39.87	50.83	42.79	29.09	22.57	42.43	56.14	34.24	37.53	36.61
37.06	37.9	51.31	35.82	45.32	64.03	44.71	52.3	35.05	63.18	31.14	39.69	30.02
63.04	45.75	35.61	29.41	36.1	51.74	25.12	22.78	34.58	24.82	48.23	40.42	33.28
30.31	51.01	50.03	27.9	38.59	36.36	28.61	33.88	39.1	33.92	44.32	35.52	35.8
26.16	56.68	49.71	17.58	32.14	26.05	30.57	21.71	26.03	43.27	30.1	33.37	24.51
28.1	46.39	46.76	19.47	30.72	26.89	29.68	23.48	32.13	43.37	32.85	27.2	30.8
28.1	46.39	46.76	19.47	30.72	26.89	29.68	23.48	32.13	43.37	32.85	27.2	30.8
58.29	31.68	26.94	30.63	23.78	13.41	25.5	39.3	37.97	40.94	31.29	30.44	30.72
58.29	31.68	26.94	30.63	23.78	13.41	25.5	39.3	37.97	40.94	31.29	30.44	30.72
10.75	28.01	27.16	22.76	28.08	25.36	17.25	36.1	47.03	51.12	45.34	42.17	33.96
25.44	36.68	36.27	19.43	18.94	21.1	21.88	29.8	45.83	31.93	41.4	38.76	30.19
33.57	44.99	42.79	20	23.69	24.03	26.3	18.42	30.64	26.65	27.86	17.69	24.49
31.77	20.19	21.1	20.15	20.73	18.99	16.15	36.9	54.25	31.81	53.78	37.87	40.35
11.01	17.8	16.63	15.46	44.38	15.87	18.14	38.24	45.81	59.41	56.54	39.79	37.2
25.25	41.92	36.48	24.5	36.32	34.09	23.69	12.96	22.56	17.9	20.81	24.79	24.6
21.28	34.58	24.65	23.32	23.44	33.25	14.6	31.74	31.24	25.6	32.84	35.02	36.73
21.56	31.58	41.87	22.82	25.74	32.55	20.34	10.7	32.49	5.78	9.42	30.96	12.9
21.56	31.58	41.87	22.82	25.74	32.55	20.34	10.7	32.49	5.78	9.42	30.96	12.9
21.56	31.58	41.87	22.82	25.74	32.55	20.34	10.7	32.49	5.78	9.42	30.96	12.9

FIG.11-1B

SUBSTITUTE SHEET (RULE 26)



yes	20.63722222	CASP8 vC	13.85	22.06	21.66	6.36	8.83
yes	20.63722222	CASP8 vD	13.85	22.06	21.66	6.36	8.83
yes	20.095	CFLAR	8.95	20.19	24.44	7.18	10.73
yes	20.095	ITGAL	8.95	20.19	24.44	7.18	10.73
yes	19.60611111	C7	15.43	16.04	3.63	6.54	7.85
yes	17.78388889	SNX15 vA	21.26	14.03	7.53	3.22	3.79
yes	17.78388889	SNX15 VB	21.26	14.03	7.53	3.22	3.79
yes	16.50388889	WAS	11.56	8.27	18.49	14.07	13.09
yes	16.25444444	RGS9	21.76	21.09	16.66	8.49	8.42
yes	15.75388889	NPPB	16.23	13.18	6.03	10.69	11.98
yes	15.385	IGFBP4	18.93	16.39	20.3	9.61	8.81
yes	14.88388889	ICAM1	16.78	14.91	12.27	6.06	7.82
yes	14.83166667	GADD45G	15.05	17.11	11.07	9.89	10.69
yes	14.64888889	TNFRSF10B v1	10.49	20.37	13.61	3.87	6.92
yes	13.90888889	APOE	22.7	13.34	9.62	4.71	6.01
yes	13.59888889	PTCH	17.95	11.59	22.85	10.66	15.35
yes	12.95166667	CHRNB1	17.43	16.11	26.41	14.62	13.23
yes	12.945	ADRA1A v2	7.67	12.37	12.49	3.29	4.53
yes	12.65111111	IL1B	6.54	4.43	18.09	6.8	7.5
yes	12.33333333	GFRA4 v1	10.79	11.64	22.89	16.21	11.69
yes	12.33333333	GFRA4 v2	10.79	11.64	22.89	16.21	11.69
yes	12.33333333	GFRA4 v3	10.79	11.64	22.89	16.21	11.69
yes	12.21833333	C1QA	9.06	10.06	21.73	15.79	11.83
yes	12.09722222	SYK	14.44	9.42	10.22	9.4	8.89
yes	12.07333333	CXCL1	12.25	10.54	17.15	10.51	7.63
yes	12.07333333	CXCL2	12.25	10.54	17.15	10.51	7.63
yes	12.07333333	CXCL3	12.25	10.54	17.15	10.51	7.63
yes	11.77333333	NTF3	9.44	15.01	8.47	6.11	8.68
yes	11.38142857	ITGAX	19.65	18.97	9.7	4.1	5.93

FIG.11-2A

JJ 7295	W 202597	W 203445	W 203215	W 204373	W 204118	W 202431	PIF 2057	PIF 2127	PIF 2052	PIF 2160	PIF 2113	PIF 3003
21.56	31.58	41.87	22.82	25.74	32.55	20.34	10.7	32.49	5.78	9.42	30.96	12.9
21.56	31.58	41.87	22.82	25.74	32.55	20.34	10.7	32.49	5.78	9.42	30.96	12.9
13.97	34.78	26.67	17.82	22.28	22.68	20.45	26.43	12.43	17.75	28.03	33.22	13.71
13.97	34.78	26.67	17.82	22.28	22.68	20.45	26.43	12.43	17.75	28.03	33.22	13.71
11.75	10.09	11.86	16.87	19.48	15.67	10.54	36.43	41.68	24.53	27.71	42.69	34.12
13.68	11.07	12.29	14.86	13.07	12.07	8.01	27.26	40.26	23.13	36.79	24.55	33.24
13.68	11.07	12.29	14.86	13.07	12.07	8.01	27.26	40.26	23.13	36.79	24.55	33.24
7.44	32.91	23.53	10.15	10.6	11.81	19.73	16.21	18.86	19.28	22.03	21.24	17.8
34.75	20.32	19.8	17.97	13.55	18.58	13.25	10.3	13.72	13.09	12.93	14.84	13.06
7.42	17.66	16.81	14	17.73	14.64	11.92	16.27	22.6	19.92	27.37	16.55	22.57
35.76	14.66	17.11	18.39	13.09	17.66	11.75	14.32	10.2	11.26	14.02	12.72	11.95
23.16	10.96	14.63	15.88	12.61	14.63	10.07	29.73	16.21	13.58	13.46	22.95	12.2
8.54	13.23	11.81	15.72	17.43	16.21	10.1	15.25	23.7	13.88	19.34	17.42	20.53
17.47	17.37	26.09	14.6	18.76	17.1	16.19	13.86	11.36	13.18	14.91	14.98	12.55
20.78	20.65	25.13	17.13	13.42	11.11	17.01	8.62	12.65	7.42	10.86	9.97	19.23
13.66	41.82	33.41	14.88	13.93	12.6	21.66	2.19	3.83	1.65	1.61	2.33	2.81
24.53	13.01	13.81	16.19	12.31	15.33	13.11	5.26	5.68	6.8	7.55	5.78	5.97
10.4	13.66	12.65	11.81	12.6	15.53	8.04	16.82	18.55	22.72	16.49	18.52	14.87
6.78	32.41	27.82	7.08	11.21	8.16	19.42	12.17	9.56	11.59	13.15	12.05	12.96
8.59	13.92	10.85	10.98	15.92	14.02	11.19	10.34	10.12	10.53	11.63	7.76	12.93
8.59	13.92	10.85	10.98	15.92	14.02	11.19	10.34	10.12	10.53	11.63	7.76	12.93
8.59	13.92	10.85	10.98	15.92	14.02	11.19	10.34	10.12	10.53	11.63	7.76	12.93
10.01	9.5	10.77	9.16	10.78	11.14	9.67	9.08	12.22	12.86	16.23	15.79	14.25
13.01	18.62	21.82	13.63	9.03	10.28	13.35	9.25	12.61	6.41	14.83	8.03	14.51
21.38	11.4	13.83	13.66	7.18	8.81	9.81	18.58	10.62	11.73	11.47	9.51	11.26
21.38	11.4	13.83	13.66	7.18	8.81	9.81	18.58	10.62	11.73	11.47	9.51	11.26
21.38	11.4	13.83	13.66	7.18	8.81	9.81	18.58	10.62	11.73	11.47	9.51	11.26
4.81			13.25	12.22	13.83		14.88	19.21	17.23	8.15	11.72	13.59
20.78			13.38	14.34	18.35		8.31	4.14	12.71	3.04	5.94	

FIG.11-2B

10.93722222	TCF4	13.28	11.92	12.37	12.38	16.68	11.43	yes
10.80833333	ENSA	10.13	5.89	7.02	4.98	7.79	10.42	yes
10.74777778	TNFRSF6B vM68E	10.88	6.83	7.28	6.17	6.92	6.54	yes
10.6	FKBP4	14.35	10.15	11.68	5.81	5.96	11.15	yes
10.32277778	IL-23R	4.1	6.54	12.54	4.86	5.64	4.92	yes
10.04166667	TLOC1	14.31	13.16	9.86	4.86	4.31	17.88	yes
10.03764706	GPR50	11.7	-10.89	7.25	7.29	8.62	23.05	yes
9.897222222	CD44	5.95	5.9	4.24	3.02	1.87	7.34	yes
9.871666667	HSPA6	20.67	15.04	7.9	1.23	3.28	20.93	yes
9.546666667	CEBPB	5.01	6.31	19.35	14.63	14.98	5.95	yes
9.263333333	SLC25A3 vB	3.33	7.08	7.62	11.31	5.93	3.64	yes
9.225	NR4A1	7.62	8.89	10.99	6.3	6.34	5.64	yes
8.937777778	CHGA	6.29	5.91	1.17	4.21	4.61	4.66	yes
8.909444444	ABCB1	7.55	8.05	3.47	9.79	7.65	3.13	yes
8.655882353	RELB	13.64	9.99	11.54	3.07	3.6	11.5	yes
8.546666667	CLC	8.72	7.81	3.12	8.99	8.08	5.11	yes
8.52222222	CHRNA10	10.74	10.1	14.09	6.09	6.53	17.11	yes
8.306470588	SNAP25 v2	6.34	3.18	4.19	2.55	2.75	6.14	yes
8.27	IL1F9	9.84	6.39	5.19	3.91	5.03	10.29	yes
8.15	SCG2	6.73	6.87	5.66	15.93	14.96	6.43	yes
8.130555556	NFKBIA	9.03	8.67	1.79	1.81	3.13	5.67	yes
7.913888889	COMT vMB	10.93	10.25	2.96	1.63	2.26	16.37	yes
7.913888889	COMT vS	10.93	10.25	2.96	1.63	2.26	16.37	yes
7.911176471	ADRA1B	7.76	8.47	11.08	9.49	7.66	15.02	yes
7.780555556	HARC	7.11	4.94	5.53	3.7	4.13	5.9	yes
7.776111111	SCYA3	7.25	7.26	11.4	5.55	5.74	8.34	yes
7.65	CACNG2	8.33	3.5	6.21	5.13	4.14	14.7	yes
7.577222222	RAI	11.62	8.85	4.59	1.99	1.23	9.43	yes
7.463333333	ARTN v1	5.89	6.89	5.52	3.88	3.98	8.21	yes
7.463333333	ARTN v2	5.89	6.89	5.52	3.88	3.98	8.21	yes
7.463333333	ARTN v3	5.89	6.89	5.52	3.88	3.98	8.21	yes

FIG.11-3A

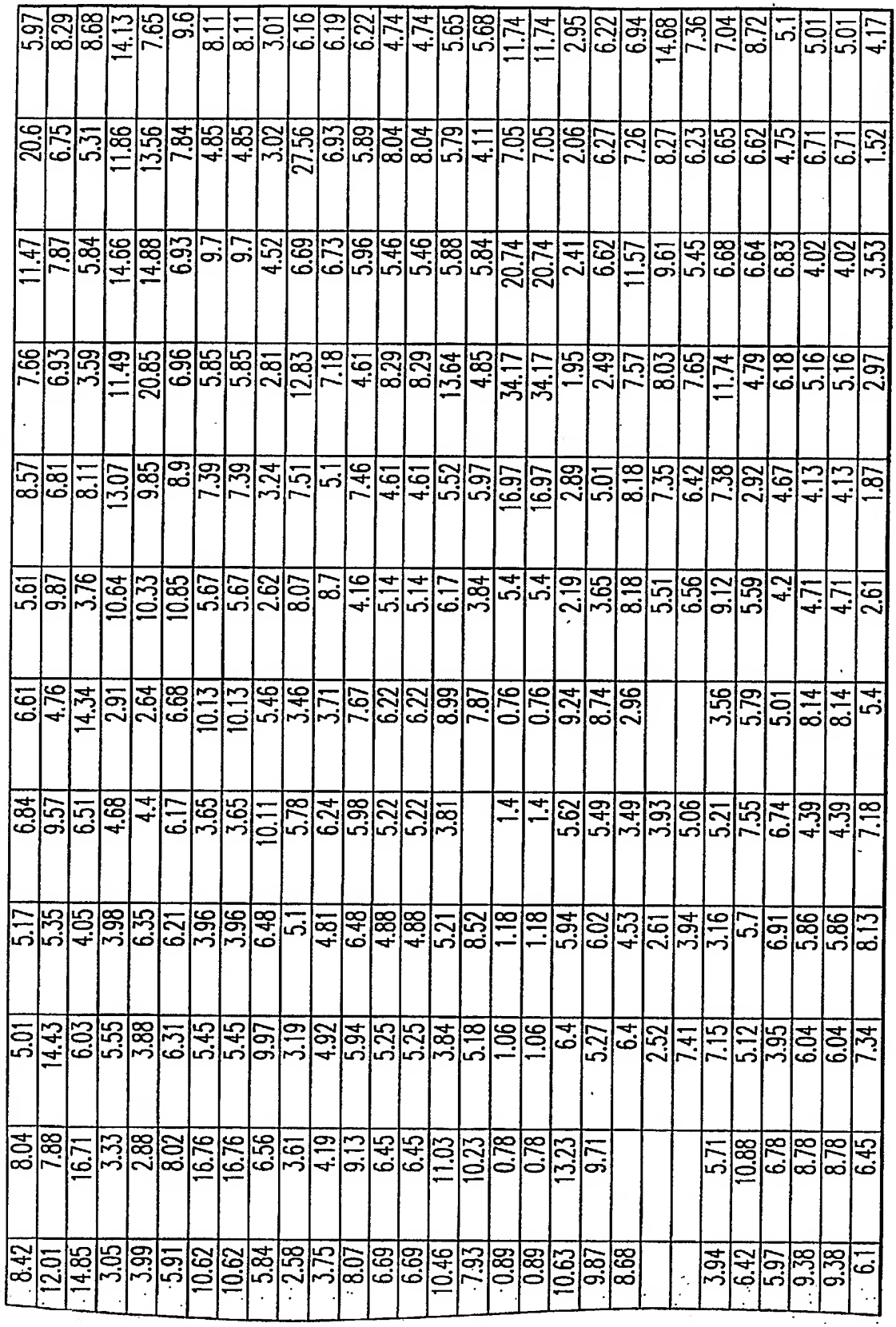
25.61	25.2	5.84	10.69	11.43	17.17	3.57	4.07	4.12	3.47	3.48	4.16	
29.73	20.79	10.24	11.16	10.34	16.32	10.7	9.06	5.68	8.12	6.46	9.72	
18.84	13.58	8.45	12.2	8.77	11.39	10.22	13.1	11.44	12.36	13.36	15.13	
13.98	22.45	11.31	7.68	9.02	13.94	8.35	9.79	5.06	10.32	6.82	12.98	
11.16	24.83	6.08	10.44	9.08	13.1	11.05	7.02	10.78	10.47	17.17	16.03	
12.3	22	11.84	7.37	7.66	13.75	8.75	6.84	6.99	6.39	5.59	6.89	
9.72	7.34		8.76	12.87	6.71	10.88	6.61	8.8	17.51	6.8	5.84	
9.26	7.69	5.52	5.94	4.76	7.1	19.22	20.29	15.25	14.39	22.84	17.57	
9.29	16.26	17.85	17.11	21.05	12.36	2.24	2.6	1.21	3.17	2.19	3.31	
10.73	9.91	5.42	7.52	6.89	8.34	5.51	9.22	12.88	12.17	9.06	7.96	
7.33	4.51	5.04	23.19	7.09	4.13	7.17	11.41	18.71	16.98	14.41	7.86	
5.58	5.13	8.36	11.48	10.59	5.05	10.61	10.43	13.86	14.17	11.16	13.85	
3.82	5.3	5.97	5.72	4.52	5.37	11.43	24.1	14.78	15.93	18.51	18.58	
11.68	10.11	7.91	8.12	6.74	9.48	9.35	15.24	11.48	8.06	12.93	9.63	
14.69	17.55		10.86	11.85	10.07	4.07	3.37	5.4	3.88	3.74	8.33	
8.81	10.94	8.48	8.04	6.52	7.69	10.41	12.52	8.63	10.85	7.9	11.22	
6.72	8.15	9.71	7.37	9.71	6.6	7.14	5.93	5.88	8.83	5.48	7.22	
6.63	6.17		3.15	2.72	5.72	13.29	18.43	7.74	20.41	10.7	21.1	
11.95	10.95	9.95	7.57	5.86	8.12	10.28	8.35	12.05	5.79	7.48	9.86	
11.97	16.57	6.62	7.04	5.29	13.18	3.52	5.93	7.47	4.99	3.72	3.82	
5.34	6.7	10.49	6.58	7.25	4.38	13.8	12.85	13.83	12.23	8.37	14.43	
10.77	7.29	10.26	8.14	3.89	3.35	7.73	11.3	11.12	10.65	6.33	7.22	
10.77	7.29	10.26	8.14	3.89	3.35	7.73	11.3	11.12	10.65	6.33	7.22	
7.66	7.47	9.95	5.56		6.39	4.89	5.78	4.68	9.56	5.79	7.28	
6.1	5.76	4.77	3.86	3.83	4.21	14.9	13.99	12.41	10.44	15.86	12.61	
6.58	7.51	6.03	7.47	6.82	7.17	9	7.1	8.88	9.7	8.26	9.91	
3.34	3.88	8.34	6.17	7.53	3.69	10.59	10.33	11.65	10.86	8.13	11.18	
8.53	9.24	10.79	8.55	9.17	9.37	4.45	10.33	4.38	7.78	6.57	9.52	
8.42	8.04	5.01	5.17	6.84	6.61	5.61	8.57	7.66	11.47	20.6	5.97	
8.42	8.04	5.01	5.17	6.84	6.61	5.61	8.57	7.66	11.47	20.6	5.97	
8.42	8.04	5.01	5.17	6.84	6.61	5.61	8.57	7.66	11.47	20.6	5.97	

FIG.11-3B

7.463333333	ARTN v4	5.89	6.89	5.52	3.88	3.98	8.21
7.383888889	CCL13	6.86	11.73	4.17	1.23	2.02	6.38
7.287777778	SLC6A12	6.43	2.81	7.91	2.97	4.64	8.64
7.136666667	LIF	5.53	5.25	6.18	2.84	2.91	6.4
6.943888889	SLC6A3	2.37	3.51	4.8	5.86	5.21	1.98
6.879444444	IL21R	7.64	7.41	6.21	2.19	2.71	7.29
6.843888889	LTB v1	3.82	3.28	6.16	6.4	8.24	3.15
6.843888889	LTB v2	3.82	3.28	6.16	6.4	8.24	3.15
6.702777778	CD2	9.13	9.38	9.52	7.01	6.65	15.32
6.65	CCL4	3.85	4.51	7.06	3.73	3.44	4.57
6.456666667	ADRA1A v4	7.61	6.96	12.03	4.82	3.54	12.81
6.395555556	MS4A4A v1	5.26	3.86	6.26	8.03	10.39	3.75
6.391111111	MAPKAPK2 v1	5.36	5.95	12.08	6.63	5.23	8.8
6.391111111	MAPKAPK2 v2	5.36	5.95	12.08	6.63	5.23	8.8
6.335	CACNA1D	4.44	3.14	3.03	4.92	8.7	3.81
6.276470588	CLEC2	5.76	5.48	4.15	7.98	9.35	3.96
6.124444444	IL11RA v1	1.22	1.4	1.67	1	0.75	2.06
6.124444444	IL11RA v2	1.22	1.4	1.67	1	0.75	2.06
6.087777778	TNFRSF5 v1	7.95	7.21	3.81	10.18	9.33	5.59
5.990555556	CDKN1A	4.3	2.39	4.09	7.51	8.65	5.53
5.918823529	VIAAT	5.38	5.37	4.48	2.86	3.26	3.51
5.892666667	ARIX	1.61	2.12	15.65	1.76	2.48	2.26
5.886666667	PRKCB1	6.6	6.09	6.11	2.52	2.41	8.49
5.88	PPARD	7.63	6.16	1.77	0.8	0.92	11.22
5.858333333	CASP7 vb	3.23	6.2	10	1.92	2.59	4.77
5.85	FOS	4.63	5.28	9.95	6.33	4.52	7.5
5.69	SP110	4.6	3.63	4.93	8	6.11	2.82
5.69	SP110 vC	4.6	3.63	4.93	8	6.11	2.82
5.67	CTF1	5.55	5.55	9.19	10.52	9.67	4.31

yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes

FIG.11-4A

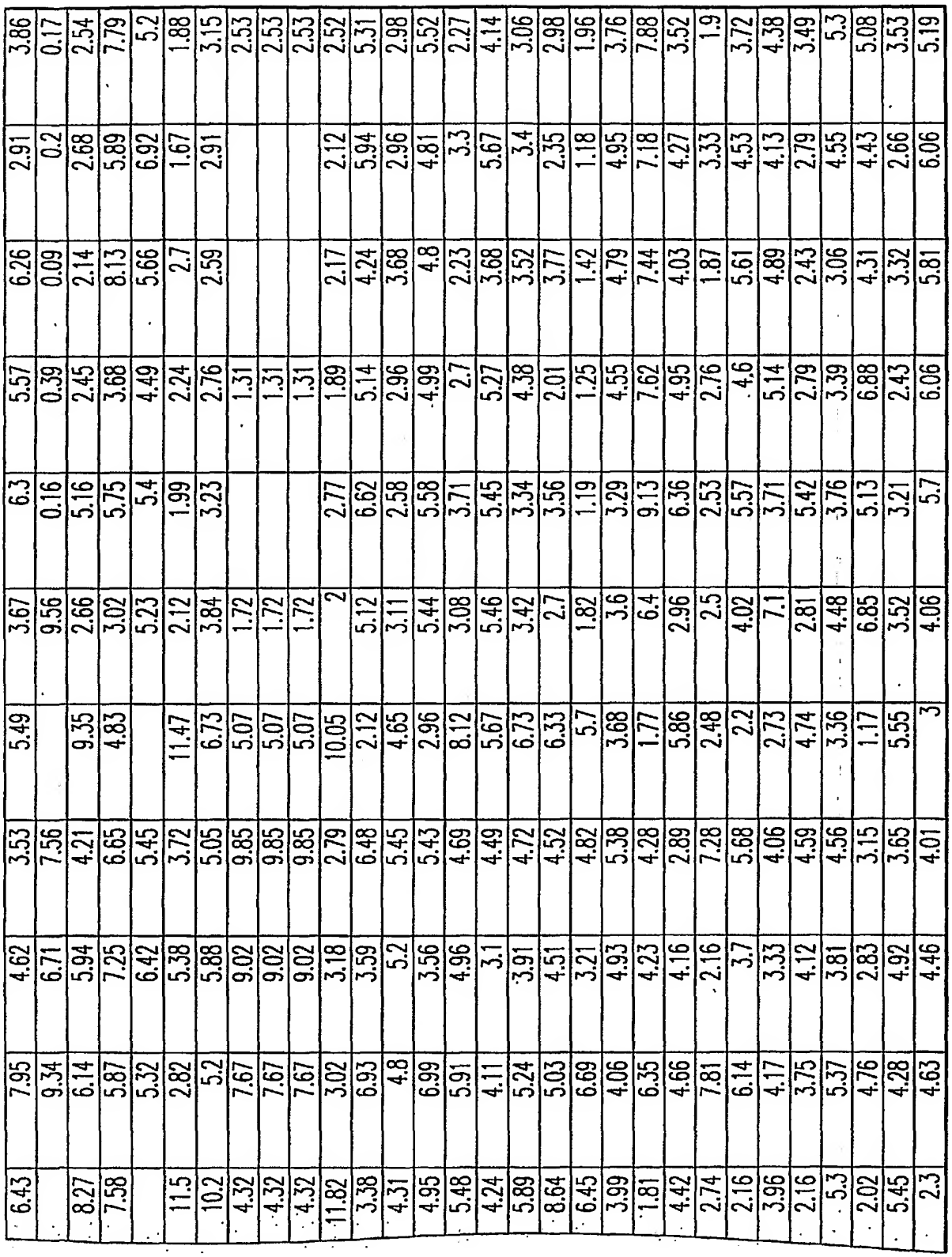


8.42	8.04	5.01	5.17	6.84	6.61	5.61	8.57	7.66	11.47	20.6	5.97
12.01	7.88	14.43	5.35	9.57	4.76	9.87	6.81	6.93	7.87	6.75	8.29
14.85	16.71	6.03	4.05	6.51	14.34	3.76	8.11	3.59	5.84	5.31	8.68
3.05	3.33	5.55	3.98	4.68	2.91	10.64	13.07	11.49	14.66	11.86	14.13
3.99	2.88	3.88	6.35	4.4	2.64	10.33	9.85	20.85	14.88	13.56	7.65
5.91	8.02	6.31	6.21	6.17	6.68	10.85	8.9	6.96	6.93	7.84	9.6
10.62	16.76	5.45	3.96	3.65	10.13	5.67	7.39	5.85	9.7	4.85	8.11
10.62	16.76	5.45	3.96	3.65	10.13	5.67	7.39	5.85	9.7	4.85	8.11
5.84	6.56	9.97	6.48	10.11	5.46	2.62	3.24	2.81	4.52	3.02	3.01
2.58	3.61	3.19	5.1	5.78	3.46	8.07	7.51	12.83	6.69	27.56	6.16
3.75	4.19	4.92	4.81	6.24	3.71	8.7	5.1	7.18	6.73	6.93	6.19
8.07	9.13	5.94	6.48	5.98	7.67	4.16	7.46	4.61	5.96	5.89	6.22
6.69	6.45	5.25	4.88	5.22	6.22	5.14	4.61	8.29	5.46	8.04	4.74
6.69	6.45	5.25	4.88	5.22	6.22	5.14	4.61	8.29	5.46	8.04	4.74
10.46	11.03	3.84	5.21	3.81	8.99	6.17	5.52	13.64	5.88	5.79	5.65
7.93	10.23	5.18	8.52		7.87	3.84	5.97	4.85	5.84	4.11	5.68
0.89	0.78	1.06	1.18	1.4	0.76	5.4	16.97	34.17	20.74	7.05	11.74
0.89	0.78	1.06	1.18	1.4	0.76	5.4	16.97	34.17	20.74	7.05	11.74
10.63	13.23	6.4	5.94	5.62	9.24	2.19	2.89	1.95	2.41	2.06	2.95
9.87	9.71	5.27	6.02	5.49	8.74	3.65	5.01	2.49	6.62	6.27	6.22
8.68		6.4	4.53	3.49	2.96	8.18	8.18	7.57	11.57	7.26	6.94
		2.52	2.61	3.93		5.51	7.35	8.03	9.61	8.27	14.68
		7.41	3.94	5.06		6.56	6.42	7.65	5.45	6.23	7.36
3.94	5.71	7.15	3.16	5.21	3.56	9.12	7.38	11.74	6.68	6.65	7.04
6.42	10.88	5.12	5.7	7.55	5.79	5.59	2.92	4.79	6.64	6.62	8.72
5.97	6.78	3.95	6.91	6.74	5.01	4.2	4.67	6.18	6.83	4.75	5.1
9.38	8.78	6.04	5.86	4.39	8.14	4.71	4.13	5.16	4.02	6.71	5.01
9.38	8.78	6.04	5.86	4.39	8.14	4.71	4.13	5.16	4.02	6.71	5.01
6.1	6.45	7.34	8.13	7.18	5.4	2.61	1.87	2.97	3.53	1.52	4.17

FIG.11-4B

5.597222222	INS	10.13	5.8	6.98	2.05	3.04	8.47	7.69	yes
5.471333333	AVPR1B	8.86	9.31	8.5	4.19	4.4	12.63		yes
5.413333333	PSMB8 v1	5.19	5.23	3.26	9.68	8.6	3.38	10.56	yes
5.38	CDKN1C	5.69	3.29	2.25	1.11	2.61	4.15	11.3	yes
5.222666667	CCL2	3.92	4.85	7	4.22	5.3	2.96		yes
5.18	ALDH3A1	2.42	2.21	7.86	4.11	6.75	2.54	19.86	yes
5.034444444	STIP1	5.27	4.73	1.84	6	7.42	3.88	9.94	yes
5.028	LAIR1 vA	6.19	6.03	5.46	4.5	5.31	4.1	2.34	yes
5.028	LAIR1 vB	6.19	6.03	5.46	4.5	5.31	4.1	2.34	yes
5.028	LAIR1 vD	6.19	6.03	5.46	4.5	5.31	4.1	2.34	yes
4.964444444	NCOA2	2.53	2.64	5.95	10.7	10.38	3.53	9.3	yes
4.931111111	ILF1	6.38	6.66	2.47	1.51	1.11	12.79	2.97	yes
4.868888889	ASCL1	4.44	5.23	9.3	8.09	6.55	6.48	4.87	yes
4.796111111	ITGA3 vB	5.38	5.84	3.31	1.02	1	10.91	3.84	yes
4.697222222	C8A	6.58	6.23	2.35	8.28	6.09	4.02	4.55	yes
4.657777778	PRKRIR	2.54	2.38	3.56	5.51	6.66	2.1	9.81	yes
4.597222222	IGF1	4.7	4.12	8.35	2.28	2.76	4.35	8.58	yes
4.59	SLC6A7	6.57	4.76	3.15	6.36	4.1	5.59	5.69	yes
4.550555556	GABRA2	7.9	5.35	7.45	4.4	4.14	10.98	6	yes
4.540555556	XCR1	4.86	5.45	5.84	5.1	3.67	5.05	4.78	yes
4.499444444	SLC11A2	3.54	3.98	0.89	1.71	2.68	1.87	2.23	yes
4.488888889	GHRH	7.66	3.86	3.43	1.95	2.53	6.42	6.87	yes
4.485	EGFR	6.92	8.6	3.2	1.23	1.82	17.97	3.63	yes
4.461111111	IRF3	3.83	4.08	2.44	4.94	4.7	9.4	2.98	yes
4.373888889	NR2F6	4.78	5.37	6.43	1.56	1.62	8.49	2.88	yes
4.266111111	CSF3R v1	5.27	5.35	8.15	5.26	4.1	6.42	3.15	yes
4.173333333	PCSK1N	8.3	5.79	1.7	1.21	1.5	5.48	4.2	yes
3.979444444	PGDS	4.45	5.12	1.52	0.36	0.33	11.82	1.42	yes
3.979444444	IFI44	4.97	4.39	3.43	3.75	4.53	2.84	5.2	yes
3.922222222	HSPB1	2.87	3.74	4.06	2.17	1.34	2.24	2.9	yes

FIG.11-5A



6.43	7.95	4.62	3.53	5.49	3.67	6.3	5.57	6.26	2.91		3.86
	9.34	6.71	7.56		9.56	0.16	0.39	0.09	0.2		0.17
8.27	6.14	5.94	4.21	9.35	2.66	5.16	2.45	2.14	2.68		2.54
7.58	5.87	7.25	6.65	4.83	3.02	5.75	3.68	8.13	5.89		7.79
	5.32	6.42	5.45		5.23	5.4	4.49	5.66	6.92		5.2
11.5	2.82	5.38	3.72	11.47	2.12	1.99	2.24	2.7	1.67		1.88
10.2	5.2	5.88	5.05	6.73	3.84	3.23	2.76	2.59	2.91		3.15
4.32	7.67	9.02	9.85	5.07	1.72		1.31				2.53
4.32	7.67	9.02	9.85	5.07	1.72		1.31				2.53
4.32	7.67	9.02	9.85	5.07	1.72		1.31				2.53
11.82	3.02	3.18	2.79	10.05	2	2.77	1.89	2.17	2.12		2.52
3.38	6.93	3.59	6.48	2.12	5.12	6.62	5.14	4.24	5.94		5.31
4.31	4.8	5.2	5.45	4.65	3.11	2.58	2.96	3.68	2.96		2.98
4.95	6.99	3.56	5.43	2.96	5.44	5.58	4.99	4.8	4.81		5.52
5.48	5.91	4.96	4.69	8.12	3.08	3.71	2.7	2.23	3.3		2.27
4.24	4.11	3.1	4.49	5.67	5.46	5.45	5.27	3.68	5.67		4.14
5.89	5.24	3.91	4.72	6.73	3.42	3.34	4.38	3.52	3.4		3.06
8.64	5.03	4.51	4.52	6.33	2.7	3.56	2.01	3.77	2.35		2.98
6.45	6.69	3.21	4.82	5.7	1.82	1.19	1.25	1.42	1.18		1.96
3.99	4.06	4.93	5.38	3.68	3.6	3.29	4.55	4.79	4.95		3.76
1.81	6.35	4.23	4.28	1.77	6.4	9.13	7.62	7.44	7.18		7.88
4.42	4.66	4.16	2.89	5.86	2.96	6.36	4.95	4.03	4.27		3.52
2.74	7.81	2.16	7.28	2.48	2.5	2.53	2.76	1.87	3.33		1.9
2.16	6.14	3.7	5.68	2.2	4.02	5.57	4.6	5.61	4.53		3.72
3.96	4.17	3.33	4.06	2.73	7.1	3.71	5.14	4.89	4.13		4.38
2.16	3.75	4.12	4.59	4.74	2.81	5.42	2.79	2.43	2.79		3.49
5.3	5.37	3.81	4.56	3.36	4.48	3.76	3.39	3.06	4.55		5.3
2.02	4.76	2.83	3.15	1.17	6.85	5.13	6.88	4.31	4.43		5.08
5.45	4.28	4.92	3.65	5.55	3.52	3.21	2.43	3.32	2.66		3.53
2.3	4.63	4.46	4.01	3	4.06	5.7	6.06	5.81	6.06		5.19

FIG.11-5B

3.910555556	CCR2 vB	2.72	2.3	5.29	6.38	6.49	2.23	6.32
3.889444444	TEK	2.97	3.05	7.49	2.7	4.27	2.44	3.7
3.855	LTA	3.57	3.51	8.26	4.98	5.38	5.65	3.74
3.635	OXT	3.96	2.55	2.23	0.7	0.95	3.95	2.93
3.611111111	HCRTR2	5.55	4.72	5.28	2.61	3.79	5.97	2.07
3.582777778	TNFSF9	3.69	3.3	4.84	2.16	1.62	6.33	2.23
3.575	PDCD4 v1	5.72	2.98	0.8	0.54	0.87	3.91	1.64
3.575	PDCD4 v2	5.72	2.98	0.8	0.54	0.87	3.91	1.64
3.501111111	CYP27B1	2.33	2.8	6.07	5.95	3.45	2.47	3.29
3.489411765	GMEB1 v1	0.08	0.09	0.08	0.02		0.17	0.1
3.489411765	GMEB1 v2	0.08	0.09	0.08	0.02		0.17	0.1
3.457647059	CHRM4	0.08	0.1	0.11	0.05	0.06		0.09
3.421666667	MMP3	1.22	1.54	4.75	4.3	4.38	1.71	2.28
3.388333333	HDC	0.38	0.43	1.03	0.63	0.6	0.45	0.57
3.354444444	NFKBIL2	3.27	4.19	5.43	3.29	3.05	6.19	2.62
3.313333333	IL-17RC	4.43	5.63	2.47	2.96	2.71	4.86	1.15
3.288888889	CISH v1	1.86	1.72	2.27	1	0.9	1.91	0.62
3.288888889	CISH v2	1.86	1.72	2.27	1	0.9	1.91	0.62
3.244444444	STAT1 vA	2.64	2.85	3.34	4.45	2.27	3.34	1.92
3.165555556	TGFA	3.67	3.48	2.16	1.51	2.08	1.94	3.83
3.160666667	ADRA2C	4.88	3.82	3.37	4.54	7.01	4.16	
3.159444444	CD74	3.18	2.86	3.92	1.32	2.43	2.98	2.91
3.152777778	IL3RA	1.89	1.22	3.15	4.68	5.05	1.5	6.78
3.120714286	MX1	4.92	5.35	3.46	1.74	1.49	3.97	
3.119444444	IL6ST	6.34	3.81	2.12	2.38	3.68	3.46	3.03
3.116666667	TNFRSF1B	2.84	2.49	4.14	5.04	5.29	2.98	4.41
3.107777778	IRS1	2.02	3.01	4.15	1.24	1.01	3.03	1.65
3.059444444	AGTRL2	3.42	3.06	4.01	4.2	4.3	2.74	3.57
3.040555556	PDGFRB	0.72	1.39	2.88	1.74	1.56	1.6	1.48
3.018333333	NR4A2	2.15	2.08	3.63	4.17	5.04	2.65	3.83

yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes

FIG.11-6A

6.63	2.34	3.85	2.18	5.42	3.26	3.41	3.63	2.79	2.11	3.04	
3.14	2.29	2.72	3.27	3.03	5.07	4.23	4.85	4.45	5.46	4.88	
3.71	3.01	2.97	4	4.37	2.87	2.4	2.62	3.78	1.96	2.61	
3.27	3.05	2.58	2.7	2.72	5.78	4.84	5.52	6.47	4.59	6.64	
2.89	4.66	3.24	5.09	3.37	2.15	2.87	2.35	3.17	2.5	2.72	
3.42	3.52	3.7	3.74	2.37	5.08	3.34	3.93	4.72	3	3.5	
2.05	4.67	2.54	3.63	1.49	4.29	7.54	2.12	3.85	5.8	9.91	
2.05	4.67	2.54	3.63	1.49	4.29	7.54	2.12	3.85	5.8	9.91	
2.66	2.45	3.45	3.13	3.28	3.2	3.54	2.94	4.58	4.08	3.35	
0.07	0.06	0.09	0.07	0.05	8.23	11.92	8.43	11.46	7.78	10.62	
0.07	0.06	0.09	0.07	0.05	8.23	11.92	8.43	11.46	7.78	10.62	
0.08	0.06	0.09	0.07	0.05	10.37	9.94	14.02	6.95	10.54	6.12	
2.13	1.14	1.77	1.75	2.57	2.95	3.59	8.73	4.28	9.31	3.19	
0.52	0.37	0.56	0.5	0.45	10.11	7.81	16.56	5.33	10.74	3.95	
4.14	3.64	3.11	2.53	3.23	2.62	2.49	3.36	2.16	2.43	2.63	
2.57	4.39	5.53	5.37	2.33	2.1	2.29	2.44	2.36	2.96	3.09	
3.13	1.43	2.02	1.74	2.82	4.26	6.07	9.19	4.12	8.15	5.99	
3.13	1.43	2.02	1.74	2.82	4.26	6.07	9.19	4.12	8.15	5.99	
1.85	2.7	1.96	2.5	2.21	3.25	5.55	4.69	3.69	6.52	2.67	
3.67	4.14	3.6	2.71	3.11	3	4.42	2.83	3.08	3.69	4.06	
	4.99	4.74	4.05		3.86	0.39	0.49	0.31	0.46	0.34	
3.13	1.41	2.71	1.79	2.42	4.48	3.71	3.96	3.21	5.62	4.83	
5.57	1.68	1.51	1.7	5.78	3.24	2.5	3.28	2.7	2.47	2.05	
	6.51	3.21	3.54		1.99		2.01	2.24	1.79	1.47	
3.95	3.7	4.02	3.7	3.64	1.87	2.65	1.3	1.67	2.12	2.71	
3.38	2.03	2.26	3.14	3.48	2.91	2.52	2.22	2.56	2.27	2.14	
3.2	1.47	3.11	2.72	1.91	4.37	4.57	5.23	4.92	4.25	4.08	
6.25	2.48	2.65	2.03	5.01	2.05	2.08	1.62	2.18	1.82	1.6	
1.37	1.11	1.45	0.98	1.13	7.05	6.14	6.58	3.96	6.9	6.69	
3.1	2.26	2.96	3.25	2.55	3.7	2.02	3.8	2.99	1.94	2.21	

FIG.11-6B

2.965	IFI27	1.66	0.94	2.48	1.36	1.99	1.6	yes
2.957222222	SLC6A6	2.48	3.77	1.83	0.58	0.48	3.29	yes
2.930588235	SLC6A8	2.39	2.92	2.3	3.33	2.88	1.59	yes
2.864666667	EBI3	1.76	3.43	3.81	1.73	1.63	2.33	yes
2.858888889	HTR1A	0.1	0.12	0.08	0.06	0.05	0.2	yes
2.833333333	INSIG1	3.5	3.81	3.34	1.62	1.8	3.87	yes
2.831111111	TRAF6 v1	3.48	3.26	2.02	1.41	0.95	3.41	yes
2.831111111	TRAF6 v2	3.48	3.26	2.02	1.41	0.95	3.41	yes
2.784444444	NOS3	1.07	1.12	1.03	0.46	0.72	0.79	yes
2.781333333	PPP1R1B	4.21	2.71	2.41	1.28	1.11	3.12	yes
2.776666667	TNFSF6	1.21	1.13	3.19	4.71	4.38	1	yes
2.771111111	PTCRA	4.48	5.87	1.85	0.96	0.96	4.62	yes
2.744444444	FKBP8	4.09	3.83	2.67	3.53	3.26	3.15	yes
2.735	DRD2 v1	1.99	2.03	2.91	3.56	4.24	1.92	yes
2.735	DRD2 v2	1.99	2.03	2.91	3.56	4.24	1.92	yes
2.724705882	SYN2 vIIb	1.87	2.57	2.81	2.77	2.96	3.46	yes
2.702777778	sod1	3.73	3.5	1.79	4.31	4.03	1.67	yes
2.696111111	BCL2 vB	3.01	2.78	4.82	3.57	2.81	2.38	yes
2.687777778	NR1	1.91	2.53	3.58	3.35	5.04	1.8	yes
2.687222222	FOXA3	2.23	2.82	2.01	2.35	2.2	5.56	yes
2.681666667	FKBP5	1.55	1.27	1.99	11.18	8.65	1.89	yes
2.677777778	GSTA3	4.88	2.82	0.95	0.71	0.91	4.73	yes
2.671111111	ALOX5AP	1.55	1.58	5.17	5.08	4.47	2.68	yes
2.622222222	BLR1 v1	2.86	2.96	4.32	2.96	2.51	4.14	yes
2.622222222	BLR1 v2	2.86	2.96	4.32	2.96	2.51	4.14	yes
2.588333333	DRD4	1.56	1.5	0.91	1.28	1.72	1.35	yes
2.577222222	TLR4 v1	2.51	2.45	0.99	3.86	-4.04	1.7	yes
2.577222222	TLR4 v2	2.51	2.45	0.99	3.86	4.04	1.7	yes
2.577222222	TLR4 v3	2.51	2.45	0.99	3.86	4.04	1.7	yes
2.577222222	TLR4 v4	2.51	2.45	0.99	3.86	4.04	1.7	yes

FIG. 11-7A

7.1	5.8	3.07	2.89	2.14	5.11	2.85	1.99	2.25	3.71	2.09	4.34
2.22	3.32	1.57	1.87	1.42	3.21	5.17	3.63	5.88	3.52	4.49	4.5
2.4	2.13	3.65	3.19		1.67	3.2	3.67	3.22	3.74	2.98	4.56
		3.12	2.99	3.65		3.06	2.47	3.74	4.83	2.7	1.72
0.05	0.06	0.09	0.09	0.09	0.04	10.15	7.58	15.16	5.97	7.26	4.31
4.55	6.52	4	2.26	1.96	5.7	1.13	1.51	1.94	1.39	1.05	1.05
1.69	1.41	3.37	2.67	3.53	1.8	5.04	5.35	3.31	3.3	2.65	2.31
1.69	1.41	3.37	2.67	3.53	1.8	5.04	5.35	3.31	3.3	2.65	2.31
1.1	2.36	1.18	0.9	0.9	1.51	6.24	6.59	2.61	8.16	4.82	8.56
		3.3	2.21	2.83		2.98	2.95	3.16	3.46	2.86	3.13
3.21	3.69	1.21	1.24	0.85	3.51	3.69	4.03	3.51	3.73	2.73	2.96
1.58	1.24	3.57	2.51	3.02	1.35	2.55	3.35	3.2	3.23	2.28	3.26
5.82	5.27	3.07	3.55	3.5	4.58	0.68	0.51	0.48	0.43	0.5	0.48
2.85	2.38	2.29	3.04	3.58	3.46	1.3	2.73	3.56	2.12	2.95	2.32
2.85	2.38	2.29	3.04	3.58	3.46	1.3	2.73	3.56	2.12	2.95	2.32
2.98	3.83	2.11	1.96	3.11	2.48		1.58	4.22	1.96	4.05	1.6
5.31	3.6	4.94	4.78	3.33	3.45	0.53	1.01	0.56	0.65	0.82	0.64
2.79	3.27	2.71	2.64	2.81	3.63	1.83	2.33	1.2	1.65	1.93	2.37
7.01	4.69	2.12	2.44	2.67	4.17	1.48	0.66	1.64	1.23	1.25	0.81
2.24	1.37	2.66	2.61	2.72	1.71	1.7	2.83	1.61	2.22	6.68	2.85
3.27	4.09	1.49	1.52	1.24	6.36	0.65	0.75	0.36	0.53	0.71	0.77
3.91	3.2	4.71	1.69	3.1	3.19	2.36	2.85	1.18	1.58	2.05	3.38
3.26	2.62	1.79	1.99	2.5	2.66	2.04	2.4	1.89	2.42	2.09	1.89
2.4	1.9	1.93	2.74	2.97	2.45	2.01	2.99	1.93	2.04	2.01	2.08
2.4	1.9	1.93	2.74	2.97	2.45	2.01	2.99	1.93	2.04	2.01	2.08
1.16	0.99	1.87	2.41	2.43	0.7	2.46	3.4	5.69	6.54	6.44	4.18
3.19	4.41	2.08	2.35	1.96	3.66	2.6	2.7	1.31	1.8	1.92	2.86
3.19	4.41	2.08	2.35	1.96	3.66	2.6	2.7	1.31	1.8	1.92	2.86
3.19	4.41	2.08	2.35	1.96	3.66	2.6	2.7	1.31	1.8	1.92	2.86
3.19	4.41	2.08	2.35	1.96	3.66	2.6	2.7	1.31	1.8	1.92	2.86

FIG.11-7B

2.548888889	SPN	2.19	2.41	5.49	3.44	3.24	3.35	yes
2.53444444	CALR	2.86	2.18	1.79	1.21	1.22	2.26	yes
2.521333333	IL17F	2.43	2.26	2.83	1.12	0.96	2.57	yes
2.491111111	GREB1 va	1.93	2.44	1.32	1.81	1.34	1.18	yes
2.484444444	PC v1	2.09	2.03	0.63	2.66	2.9	2.72	yes
2.484444444	PC v2	2.09	2.03	0.63	2.66	2.9	2.72	yes
2.483333333	TNFRSF21	2.74	2.85	3.57	2.24	1.96	2.22	yes
2.457222222	NRIP1	1.1	1.24	2.08	6.06	6.9	1.56	yes
2.452777778	APAF1 v2	2.28	2.85	1.09	2.28	2.53	0.92	yes
2.418823529	FCER1A	4.19	3.62		0.79	1.06	8.96	yes
2.415	HTR2C	1.69	1.86	0.7	2.85	2.8	0.8	yes
2.384444444	GABRD	2.27	2.62	2.04	3.12	2.65	1.03	yes
2.381111111	GALR3	0.46	0.38	0.24	0.11	0.11	0.52	yes
2.335294118	ERBB2	1.24	1.47		2.52	1.56	2.15	yes
2.331111111	MC4R	2.18	2.49	0.82	1.83	2.32	0.87	yes
2.327777778	GPR51	1.9	1.89	3.3	2.94	1.95	2.19	yes
2.315	RGS19IP1	2.42	2.12	0.57	1.84	2.13	1.94	yes
2.308333333	ADMR	1.29	1.52	2.11	3.57	3.32	2.31	yes
2.307777778	NR1H4	1.72	1.37	0.71	1.46	2.52	1.58	yes
2.298888889	TLR10	1.44	1.6	1.9	2.97	2.84	1.39	yes
2.285	SCAMP2	2.89	2.91	1	1.03	0.89	6.76	yes
2.283888889	FKBP2 v1	5.02	3.13	1.87	1.14	1.19	4.42	yes
2.283888889	FKBP2 v2	5.02	3.13	1.87	1.14	1.19	4.42	yes
2.272777778	LGALS3BP	1.97	1.97	3.5	2.3	1.84	2.32	yes
2.268	PDGFA v1	0.47	0.41	0.28	1.14	1.07	0.46	yes
2.268	PDGFA v2	0.47	0.41	0.28	1.14	1.07	0.46	yes
2.261666667	CCKBR	1.9	2.24	5.32	2.77	2.71	2.52	yes
2.240555556	IRAK2	2.91	2.3	1.02	1.06	1.12	6.31	yes
2.221111111	IPF1	0.79	0.75	2.8	0.98	1.54	0.75	yes
2.204444444	TLR7	2.99	3.33	1.17	0.8	0.52	7.94	yes

FIG.11-8A

1.86	2.49	1.65	2.07	2.22	2.57	2.33	1.82	2.09	2.84	1.89	1.93		
5.9	3.5	2.66	2.51	2.07	3.69	2.31	2.92	2.09	1.74	2.78	1.93		
		2.57	2.18	2.87		2.13	2.25	2.63	4.76	2.31	3.95		
2.54	2.08	3.17	4.19	2.38	1.43	2.05	4.22	4.06	2.36	2.86	3.48		
2.2	1.47	4.22	6.78	2.45	2.12	1.36	2.84	1.56	1.73	2.5	2.46		
2.2	1.47	4.22	6.78	2.45	2.12	1.36	2.84	1.56	1.73	2.5	2.46		
1.74	1.47	2.56	3.16	2.96	1.86	2.13	3.59	2.26	2.4	2.19	2.8		
4.75	3.99	1.66	1.74	1.34	4.77	0.63	1.25	2.05	0.76	1.69	0.66		
2.42	2.27	4.15	3.84	2.7	1.9	2.03	3.86	2.12	1.8	2.38	2.73		
1.25	1.27	4.27	1.73	3.61	1.33	1.4	1.56	1.86	1.55	1.51	1.16		
3.87	3.04	2.21	2.18	2.17	2.06	3.02	3.53	2.96	2.74	2.45	2.54		
1.47	1.19	2.84	3.31	3.1	1.54	1.79	3.9	2.43	2.77	2.63	2.22		
0.4	0.34	0.71	1.48	0.7	0.34	3.14	7.33	3.83	8.5	5.78	8.49		
1.72	1.31	1.48	1.6	1.9	1.92	2.74	3.13	3.32	3.43	5.24	2.97		
2.96	1.34	1.65	3	1.96	1.5	3.82	3.44	4.03	3.57	1.93	2.25		
1.94	1.72	1.86	2.17	2.46	2.44	2.63	2.02	2.36	2.74	2.18	3.21		
2.9	1.76	2.72	2.1	2.15	1.66	2.21	3.44	2.09	3.31	3.26	3.05		
2.1	1.52	1.84	1.84	2.35	1.35	3.54	1.98	4.02	2.43	2.72	1.74		
1.11	1.63	1.79	1.31	1.26	1.38	3.89	4.73	3.43	3.5	3.11	5.04		
2.89	4.96	1.41	1.6	1.95	3.41	2.25	1.93	2.47	2.52	1.89	1.96		
1.13	0.9	4.07	2.53	2.94	0.8	1.98	2.06	2.29	2.55	2.28	2.12		
2.59	2.35	2.5	2.18	1.61	2.63	2.14	2.32	2.12	1.35	1.26	1.29		
2.59	2.35	2.5	2.18	1.61	2.63	2.14	2.32	2.12	1.35	1.26	1.29		
1.79	1.82	1.84	2.01	2.22	1.57	2.74	2.2	3.44	2.66	2.36	2.36		
		0.51	0.51	0.52		0.48	6.71	6.58	4.31	4.31	6.26		
		0.51	0.51	0.52		0.48	6.71	6.58	4.31	4.31	6.26		
2.41	2.06	1.78	1.91	2.24	2.73	1.34	1.48	1.31	2.62	1.53	1.84		
1.72	1.87	3.87	1.6	3.13	0.94	1.79	2.12	2.67	2.06	1.88	1.96		
6.36	9.48	0.8	0.41	0.29	3.4	2.21	1.77	2.82	1.96	1.38	1.49		
1.62	1.09	3.58	2.72	2.72	1.05	1.38	2.29	1.64	1.51	1.57	1.76		

FIG.11-8B

2.192777778	GRM6	1.63	1.72	1.49	0.5	0.74	1.98	yes
2.187222222	IL12RB1	4.6	2.89	0.26	0.14	0.34	7.99	yes
2.178333333	FCGR2A	1.79	1.72	4.23	3.67	2.72	2.34	yes
2.154117647	GRAP2	1.87	1.72	3.31	2.96	2.73	2.22	yes
2.138333333	TPO	1.57	1.58	3.09	4.08	4.38	1.94	yes
2.124444444	CYP2B6	1.52	1.4	1.82	2.06	2.37	0.75	yes
2.120555556	STAT2	2.06	2.23	2.13	2.22	2.27	2.69	yes
2.103888889	TNFRSF1A	2.05	2.4	3.22	3.41	2.21	1.67	yes
2.087647059	SST	2.51	3.03	4.57	1.38	1.88	4.95	yes
2.083333333	ALDH9A1	2.39	2.45	1.18	2.77	2.3	1.42	yes
2.05	CR1 vF	2.52	2.05	2.26	0.71	1.16	2.28	yes
2.05	CR1 vS	2.52	2.05	2.26	0.71	1.16	2.28	yes
2.04444444	CD86	2.14	1.51	1.35	5.27	6.31	2.03	yes
2.039444444	RAG1	1.68	1.82	0.88	4.1	2.6	1.7	yes
2.028333333	CHRM1	1.72	1.08	1.53	0.53	0.96	1.42	yes
2.018333333	MASP2 v1	2.1	1.96	0.97	2.47	4.12	1.31	yes
2.004666667	C1R	1.2	1.23	2.41	3.56	4.55	1.07	yes
1.977222222	IFITM2	2.05	2.46	2.17	2.77	2.41	2.87	yes
1.947222222	UGTREL1	1.81	2.02	2.01	1.84	2.07	1.03	yes
1.944444444	CD84	2.01	1.57	3.37	3.18	2.93	1.89	yes
1.928888889	CXCR3	1.95	1.84	2.96	1.6	1.16	4.03	yes
1.928333333	NS	0.73	0.74	0.17	0.04	0.07	0.49	yes
1.916666667	HSD17B8	2.29	1.88	2.1	1.25	1.29	2.7	yes
1.907333333	WNT2	0.15	0.15	0.08	0.11	0.1	0.22	yes
1.897777778	CHRNB2	1.53	1.68	0.82	2.58	1.86	1.71	yes
1.887777778	CYP2D6	1.04	1.14	1.31	1.13	0.91	1.38	yes
1.848333333	CX3CR1	1.72	1.79	1.17	1.6	1.41	1.71	yes
1.844375	TPT1	1.27	2.2	0.89	1.46	1.14	2.17	yes
1.828235294	HRH2	1.57	1.21	3.5	2.1	3.36	1.21	yes
1.824444444	GMEB2	1.98	1.61	2.95	1.72	1.53	2.05	yes

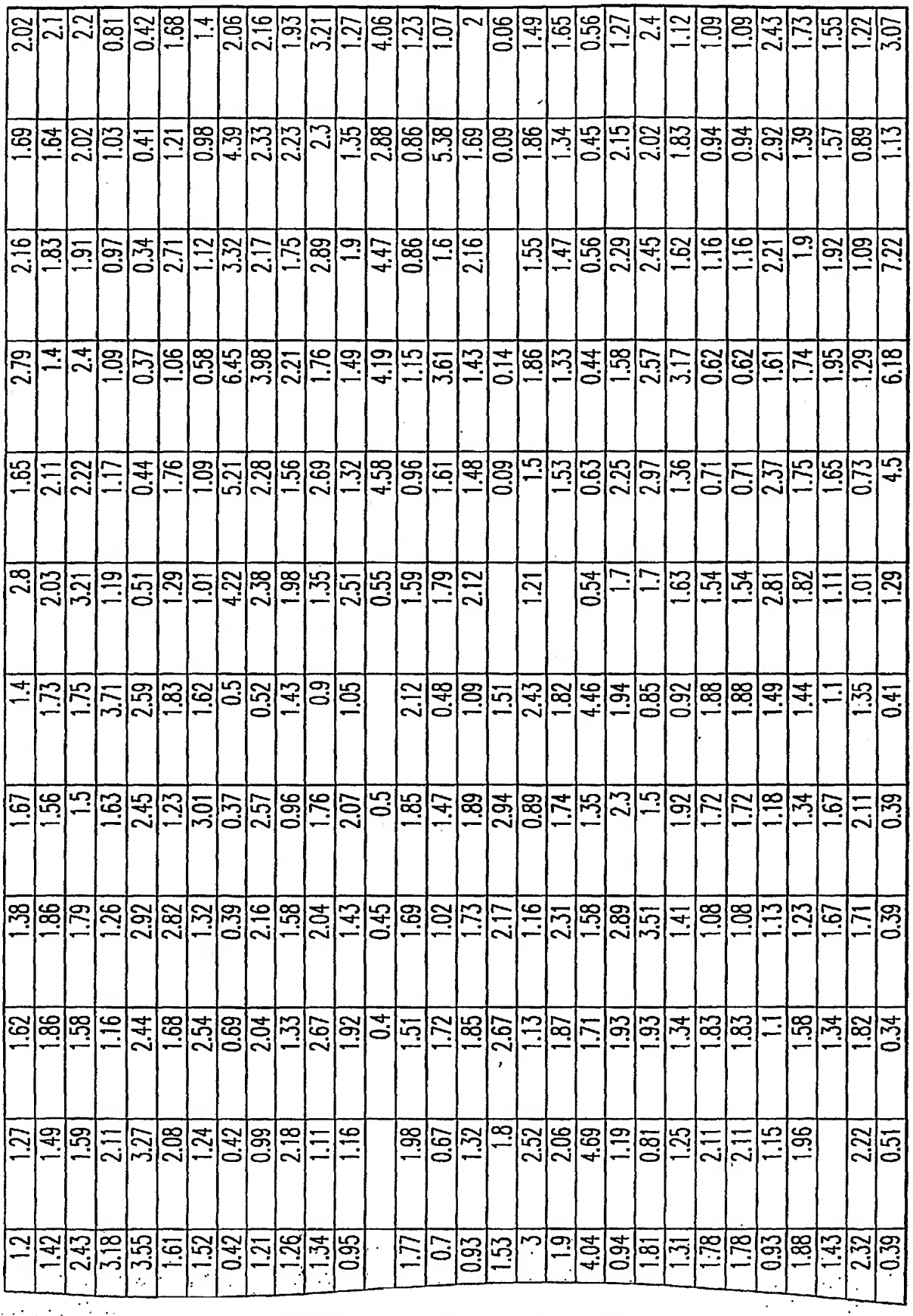
FIG.11-9A

3.61	5.74	1.47	1.53	1.16	5.49	3.66	2.2	1.19	1.3	2.01	2.05	
0.37	0.77	4.82	2.67	4.09	0.49	1.54	1.8	2.11	1.57	1.43	1.49	
1.94	1.8	1.57	1.82	1.92	1.88	1.87	1.67	2.18	2.51	1.57	2.01	
2.29	2.12	1.64	1.93	2.24	2.22		1.6	1.48	2.34	1.97	1.98	
2.88	2.3	1.34	1.86	2.15	3.24	1.16	1.23	1.28	1.58	1.8	1.03	
1.76	2.48	1.4	2.35	1.53	2.74	1.91	3.47	3.36	1.87	3.46	1.99	
1.58	1.6	2.5	2.23	2.59	1.46	2.33	2.17	1.64	2.32	1.99	2.16	
1.78	2.16	1.84	1.84	2.14	2.55	1.54	2.23	1.84	1.26	1.58	2.15	
3.13	2.86	1.84	2.98	2.55	2.36	0.32	0.41		0.24	0.18	0.3	
3.35	3.02	2.57	2.19	1.81	2.5	1.26	1.83	1.35	1.29	1.96	1.86	
5.84	4.27	1.72	1.6	1.48	3.77	2.07	1.4	1.27	0.82	0.78	0.9	
5.84	4.27	1.72	1.6	1.48	3.77	2.07	1.4	1.27	0.82	0.78	0.9	
2.73	2.84	0.31	1.56	1.43	3.06	1.12	1.22	0.71	0.93	0.92	1.36	
2.47	1.9	2.15	2.15	1.58	2.48	1.54	2.81	1.48	1.28	2.36	1.73	
3.04	4.59	1.04	1.04	0.83	3.23	2.4	2.67	1.9	2.88	1.96	3.69	
3.68	3.7	2.12	1.97	1.75	3.64	1.21	1.22	0.91	0.69	1.57	0.94	
		1.49	1.63	1.47		1.32	1.88	1.91	2.1	1.87	2.38	
1.26	1.41	2.55	3.04	2.28	1.76	1.86	1.69	1.25	0.93	1.21	1.62	
1.38	1.55	1.96	2.35	2.27	1.52	1.81	2.73	2.07	1.99	2.15	2.49	
2.48	2.44	1.9	1.59	1.92	2.45	0.76	1.28	0.85	1.52	1.5	1.36	
1.37	1.41	1.89	1.54	2.11	1.4	2.1	1.35	1.36	2.97	1.51	2.17	
0.14	0.14	0.61	0.49	0.55	0.21	2.79	6.98	2.81	5.17	4.67	7.91	
1.05	0.92	2.09	2.39	1.56	0.82	1.49	2.82	1.49	2.33	3.11	2.92	
		0.1	0.1	0.1		0.22	5.91	5.08	4.72	5.54	6.03	
1.07	1.38	2.36	4.27	3.94	1.92	1.4	1.66	1.81	1.04	1.83	1.3	
0.41	0.6	1.01	1.29	0.99	1.11	3.37	3.04	4.94	2.46	5.51	2.34	
3.75	3.14	1.93	1.66	2.34	2.71	1.39	1.38	1.58	1.56	1.25	1.18	
2.75	4	0.89	1.25	1.48	3.07	1.39	1.66		1.87		2.02	
2.01	0.76	0.54	1.61		2.61	2.09	1.72	2.08	1.5	1.49	1.72	
1.88	2.3	2.49	1.64	1.87	1.69	1.98	1.15	1.02	1.52	1.63	1.83	

FIG.11-9B

1.818888889	PADI5	2.15	1.63	1.7	1.72	1.14	2.75	yes
1.817777778	TNFSF7	1.29	1.33	3.97	2.18	1.85	1.07	yes
1.812777778	ARNTL	1.56	1.28	1	1.2	2.01	0.98	yes
1.807777778	NGFRAP1	1.01	0.92	1.57	4.02	4.62	1.09	yes
1.795555556	ALDH2	2.35	2.37	2.01	1.92	2.88	1.08	yes
1.786111111	DBI	2.38	2.1	0.81	1.22	2.58	2.1	yes
1.770555556	SLC6A9	2.04	1.79	2.26	2.79	2.06	3.5	yes
1.751111111	TSHR	0.51	0.48	0.36	0.7	0.5	0.53	yes
1.75	ADRA1D	1.33	1.47	0.7	1.04	1.15	1.02	yes
1.734444444	INSM1	1.68	2.02	1.74	1.49	1.37	2.52	yes
1.730555556	F3	1.71	1.67	0.41	0.89	1.35	1.1	yes
1.729444444	JAK3	1.56	2.12	1.79	2.09	1.8	3.35	yes
1.728666667	CD3Z	0.59	0.52	0.46	0.96	0.86	0.46	yes
1.723888889	NGFR	2.12	1.88	3.61	2.36	1.59	1.9	yes
1.71	PTPN3	1.52	1.5		0.34	0.33	4.26	yes
1.696666667	INSL3	1.8	1.71	2.15	1.76	1.76	1.67	yes
1.695625	GZMM	2.36	2.53	3.38	1.83	2.24	1.79	yes
1.684444444	NTRK1	1.12	1.19	1.35	2.57	2.61	0.88	yes
1.658235294	PLTP	2.23	1.87	1.55	0.7	0.98	1.84	yes
1.647777778	CRP	1.42	0.68	1.81	0.53	2.51	1.7	yes
1.642222222	ESR2	2.01	1.1	0.77	1.25	0.86	1.14	yes
1.636666667	BDKRB2	1.24	1.29	0.65	0.48	0.53	0.75	yes
1.620555556	CYP4F3	1.22	1.42	1.54	2.35	1.9	1.86	yes
1.608333333	TLR9 vA	1.83	1.59	2.88	2.05	1.73	2.41	yes
1.608333333	TLR9 vB	1.83	1.59	2.88	2.05	1.73	2.41	yes
1.605555556	NCAM1	1.3	1.12	1.44	1.56	1.26	0.89	yes
1.603333333	CCL5	1.41	1.52	1.16	1.43	1.7	1.88	yes
1.591176471	HM74	1.12	1.08	2.2	2.55	2.11	1.03	yes
1.583888889	LAT	2.31	2.46	0.97	2.05	1.41	1.55	yes
1.567222222	PER1	0.34	0.36	0.5	0.36	0.47	0.36	yes

FIG. 11-10A



1.2	1.27	1.62	1.38	1.67	1.4	2.8	1.65	2.79	2.16	1.69	2.02		
1.42	1.49	1.86	1.86	1.56	1.73	2.03	2.11	1.4	1.83	1.64	2.1		
2.43	1.59	1.58	1.79	1.5	1.75	3.21	2.22	2.4	1.91	2.02	2.2		
3.18	2.11	1.16	1.26	1.63	3.71	1.19	1.17	1.09	0.97	1.03	0.81		
3.55	3.27	2.44	2.92	2.45	2.59	0.51	0.44	0.37	0.34	0.41	0.42		
1.61	2.08	1.68	2.82	1.23	1.83	1.29	1.76	1.06	2.71	1.21	1.68		
1.52	1.24	2.54	1.32	3.01	1.62	1.01	1.09	0.58	1.12	0.98	1.4		
0.42	0.42	0.69	0.39	0.37	0.5	4.22	5.21	6.45	3.32	4.39	2.06		
1.21	0.99	2.04	2.16	2.57	0.52	2.38	2.28	3.98	2.17	2.33	2.16		
1.26	2.18	1.33	1.58	0.96	1.43	1.98	1.56	2.21	1.75	2.23	1.93		
1.34	1.11	2.67	2.04	1.76	0.9	1.35	2.69	1.76	2.89	2.3	3.21		
0.95	1.16	1.92	1.43	2.07	1.05	2.51	1.32	1.49	1.9	1.35	1.27		
		0.4	0.45	0.5		0.55	4.58	4.19	4.47	2.88	4.06		
1.77	1.98	1.51	1.69	1.85	2.12	1.59	0.96	1.15	0.86	0.86	1.23		
0.7	0.67	1.72	1.02	1.47	0.48	1.79	1.61	3.61	1.6	5.38	1.07		
0.93	1.32	1.85	1.73	1.89	1.09	2.12	1.48	1.43	2.16	1.69	2		
1.53	1.8	2.67	2.17	2.94	1.51		0.09	0.14		0.09	0.06		
3	2.52	1.13	1.16	0.89	2.43	1.21	1.5	1.86	1.55	1.86	1.49		
1.9	2.06	1.87	2.31	1.74	1.82		1.53	1.33	1.47	1.34	1.65		
4.04	4.69	1.71	1.58	1.35	4.46	0.54	0.63	0.44	0.56	0.45	0.56		
0.94	1.19	1.93	2.89	2.3	1.94	1.7	2.25	1.58	2.29	2.15	1.27		
1.81	0.81	1.93	3.51	1.5	0.85	1.7	2.97	2.57	2.45	2.02	2.4		
1.31	1.25	1.34	1.41	1.92	0.92	1.63	1.36	3.17	1.62	1.83	1.12		
1.78	2.11	1.83	1.08	1.72	1.88	1.54	0.71	0.62	1.16	0.94	1.09		
1.78	2.11	1.83	1.08	1.72	1.88	1.54	0.71	0.62	1.16	0.94	1.09		
0.93	1.15	1.1	1.13	1.18	1.49	2.81	2.37	1.61	2.21	2.92	2.43		
1.88	1.96	1.58	1.23	1.34	1.44	1.82	1.75	1.74	1.9	1.39	1.73		
1.43		1.34	1.67	1.67	1.1	1.11	1.65	1.95	1.92	1.57	1.55		
2.32	2.22	1.82	1.71	2.11	1.35	1.01	0.73	1.29	1.09	0.89	1.22		
0.39	0.51	0.34	0.39	0.39	0.41	1.29	4.5	6.18	7.22	1.13	3.07		

FIG.11-10B

yes	1.564444444	PTPRN	2.69	2.41	3.73	1.49	1.05	2.65	1.58
yes	1.552352941	DRD5	2.28	2.43	2.45	2.54	2.3	1.98	1.78
yes	1.546666667	IL12RB2	1.32	2.12	1.15	1.05	1.16	2.36	0.49
yes	1.544117647	TRIM34 v1	1.32	1.43	2.05	1.97	1.79	1.78	0.98
yes	1.544117647	TRIM34 v2	1.32	1.43	2.05	1.97	1.79	1.78	0.98
yes	1.543888889	CYB561	1.01	1.63	1.85	1.98	1.94	1.44	1.58
yes	1.524444444	CYP11A	1.33	1.46	2.55	1.76	1.89	1.3	1.14
yes	1.521111111	DLG3	1.52	1.23	0.73	2.32	1.85	0.91	1.36
yes	1.505882353	CYP4B1	1.69	1.57	5.13	2.23	2.07	1.12	1.68
yes	1.495555556	CCR1	1.28	1.15	0.96	2.24	2.48	0.92	2.26
yes	1.493333333	CHRNA5	1.03	1.54	0.4	0.5	0.56	0.49	0.77
yes	1.491111111	HLA-DPB1	1.29	1.57	2.05	1.03	0.69	1.27	1.18
yes	1.491111111	BCL2 vA	1.29	1.14	1.1	0.71	1.34	0.96	2.53
yes	1.481764706	TIMP2	1.33	1.96	1.9	1.62	1.61	1.75	0.98
yes	1.478333333	IL4R	1.15	1.08	2.66	2.07	2.06	1.07	1.64
yes	1.466111111	CHRNE	1.27	1.44	2.63	1.95	1.68	1.37	1.31
yes	1.466111111	PRDM2 v1	1.18	1.23	2.78	2.18	1.88	1.53	1.62
yes	1.461666667	PRSS11	2.43	1.21	1.48	0.67	0.75	1.75	2.92
yes	1.453333333	CIAS1	1.44	1.85	1.34	1.49	1.53	1.78	0.83
yes	1.442222222	PTGFR	1.28	1.62	0.58	1.04	0.98	0.42	1.37
yes	1.441666667	CRYAB	0.97	1.06	2.85	1.53	1.4	0.99	0.91
yes	1.441111111	MAP2K4	0.81	0.98	1.25	3.25	2.24	0.5	2.72
yes	1.433333333	CRHBP	0.79	0.68	1.99	2.49	2.02	0.9	1.26
yes	1.430625	ADCYAP1R1	0.76	1.29	2.06		0.92	0.6	0.93
yes	1.426666667	SPC	3.23	3.4	1.18	0.89	0.91	3.41	0.6
yes	1.422222222	PTGER1	1.07	1.36	1.99	1.13	0.74	1.2	0.67
yes	1.407647059	NR1H2	3.35	2.37	2	1.12	0.32	3.22	1.19
yes	1.395555556	CHRM3	1.88	1.44	0.99	0.98	0.81	1.86	1.29
yes	1.392777778	ENO1	0.74	0.71	1.26	3.17	3.76	1.38	1.57
yes	1.368333333	CSF2	1.51	2.08	0.94	0.47	0.55	2.87	0.6

FIG.11-11A

1.37	1.74	1.34	1.78	1.35	0.61	0.83	0.58	0.8	1.25	0.91	
1.82	1.67	2.49	2.45	1.67	0.14	0.11		0.09	0.12	0.07	
0.58	2.13	2.87	2.64	0.75	1.21	1.44	2.14	1.08	1.56	1.79	
1.24	1.45	1.27		1.1	2.47	1.52	1.49	1.81	1.21	1.37	
1.24	1.45	1.27		1.1	2.47	1.52	1.49	1.81	1.21	1.37	
1.23	1.6	1.82	1.9	1.03	0.97	0.88	2.18	1.75	1.67	1.33	
1.27	1.28	1.4	1.45	1.03	1.39	1.63	1.64	2.18	1.03	1.71	
1.63	1.32	1.19	0.85	1.46	1.78	2.29	1.41	1.22	2.37	1.94	
1.21	1.57	1.93	1.76	1.51	0.39	0.34	0.43	0.46		0.51	
2	1.2	1.67	1.19	1.94	1.19	1.3	0.98	1.31	1.14	1.71	
0.62	2.21	2.35	1.34	0.5	1.51	3.67	2.52	1.78	2.22	2.87	
1.21	1.31	1.41	1.06	1.37	1.79	1.84	1.96	1.6	1.72	2.49	
2.88	1.4	1.66	1.24	1.55	0.77	1.95	1.26	1.25	1.77	2.04	
0.91	1.37	2.23	1.59	0.66	1.58	1.77	1.38	1.37		1.18	
1.19	0.88	1.32	1.18	1.33	1.24	1.26	1.7	2.17	1.17	1.44	
1.34	1.04	1.23	1.35	1.27	1.75	1.13	1.49	1.68	1.18	1.28	
2.03	1.08	1.21	1.39	1.89	0.7	0.96	0.77	0.96	2.04	0.96	
2.43	1.54	0.78	0.81	1.66	0.93	1.46	1.52	1.66	1.03	1.28	
0.99	1.77	2.04	1.53	1	1.27	1.3	1.71	1.3	1.55	1.44	
1.09	1.48	1.66	1.41	0.89	2.08	2.59	1.63	2.37	2	1.47	
0.97	0.98	1.23	1.04	1.32	2.93	1.03	1.09	0.98	3.62	1.05	
1.49	1.82	1.79	1.24	1.97	0.96	1.34	0.88	0.95	0.78	0.97	
1.39	0.4	0.85	0.99	1.04	1.91	1.47	2.12	2.31	1.43	1.76	
0.78	1.18	1.68		1.02	1.35	2.35	2.66	1.61	1.45	2.25	
0.41	1.6	1.96	1.4	0.72	0.9	1.14	0.9	0.96	1.12	0.95	
0.79	1.14	1.18	1.28	0.74	1.69	1.74	2.29	2.83	1.68	2.08	
2.1	2.24	1.45	2.31	1.69		0.07	0.18	0.16	0.07	0.09	
1.58	0.77	1.23	1.29	1.35	1.34	1.78	1.43	1.61	1.23	2.26	
1.41	0.72	0.95	0.69	2	0.9	1.39	1.27	1.1	1.16	0.89	
0.55	1.64	0.94	1.42	0.43	2.23	1.6	1.33	1.98	1.62	1.87	

FIG.11-11B

1.36	APCS	1.5	1.47	2.08	1.21	1.94	1.2	0.75
1.355294118	NRGN	3.79	1.66	0.91	0.34		2.62	1.69
1.348333333	MKNK2	1.17	1.55	2.51	1.16	1.29	2.3	0.99
1.342941176	TBXAS1 vTXS-I	1.05	0.97	1.26	1.23	1.29	0.92	1.37
1.341666667	SNAP23 v1	1.36	1.36	0.88	1.12	1.11	2.28	0.62
1.341666667	SNAP23 v2	1.36	1.36	0.88	1.12	1.11	2.28	0.62
1.329444444	CCL18	0.37	0.4	1.05	0.82	0.68	0.51	0.74
1.325294118	TAF9 v1	2	1.62	2.98	0.65	1.15	4.35	2.02
1.319444444	CYP1A1	0.28	0.25	0.11	0.06	0.06	0.25	0.22
1.319444444	GRIN2D	0.83	0.79	1.18	1.47	1.45	0.65	1.1
1.313888889	DRD3 vA	1.08	1.19	1.04	0.53	0.48	2.17	0.56
1.313888889	DRD3 vB	1.08	1.19	1.04	0.53	0.48	2.17	0.56
1.313888889	DRD3 vC	1.08	1.19	1.04	0.53	0.48	2.17	0.56
1.313888889	DRD3 vD	1.08	1.19	1.04	0.53	0.48	2.17	0.56
1.313888889	DRD3 vE	1.08	1.19	1.04	0.53	0.48	2.17	0.56
1.306111111	NRG2 v1	2.2	1.93	1.82	0.46	0.29	3.13	1.06
1.306111111	NRG2 v2	2.2	1.93	1.82	0.46	0.29	3.13	1.06
1.306111111	NRG2 v3	2.2	1.93	1.82	0.46	0.29	3.13	1.06
1.306111111	NRG2 v4	2.2	1.93	1.82	0.46	0.29	3.13	1.06
1.303888889	TNFRSF10A	1.47	1.31	1.19	2.01	1.54	1.32	1.6
1.296470588	IFI16	0.11	0.12	0.2	0.21	19.27	0.22	0.22
1.294444444	CXCL5	1.65	1.13	0.79	1.26	2.17	1.25	1.73
1.294444444	CXCL6	1.65	1.13	0.79	1.26	2.17	1.25	1.73
1.292777778	CNOT2	1.02	0.96	1.92	1.65	2.16	1.65	1.76
1.285	SLC6A11	1.48	1.39	0.75	0.8	1.07	1.26	0.74
1.278333333	SYN3 vIIIa	0.7	0.89	1.25	0.86	0.77	0.58	0.7
1.278333333	SYN3 vIIIb	0.7	0.89	1.25	0.86	0.77	0.58	0.7
1.278333333	SYN3 vIIIc	0.7	0.89	1.25	0.86	0.77	0.58	0.7
1.275	CST3	1.08	1.31	1.43	1.45	1.95	1.44	1.3
1.271666667	TRPV2	1.67	1.29	1.7	0.99	0.75	1.7	1.39

FIG.11-12A

1.15	1.47	1.5	1.34	1.39	1.24	1.3	0.92	1.5	1.11	1.41	
2.55	1.56	0.84	1.36	1.95	0.55	0.67	0.95	0.71	0.4	0.49	
1.28	1.18	1.37	1.53	1.15	1.09	1.09	1.22	0.8	1.52	1.07	
1.61	1.21	2.07		1.97	1.18	0.93	1.56	1.47	1.06	1.68	
0.77	1.59	0.6	0.91	0.95	1.9	1.88	1.45	1.7	1.86	1.81	
0.77	1.59	0.6	0.91	0.95	1.9	1.88	1.45	1.7	1.86	1.81	
0.45	0.37	0.4	0.32	0.64	3.16	1.85	3.74	2.77	3.34	2.32	
2.06	1.27	1.71		1.34	0.38	0.19	0.19	0.2	0.19	0.23	
0.16	0.27	0.2	0.19	0.18	2.52	4.12	2.22	3.85	4.47	4.34	
0.85	1.21	1.03	1.02	1.14	1.86	1.76	1.67	1.53	2.39	1.82	
0.65	1.39	0.99	1.47	0.53	2.89	1.71	1.74	2.24	1.39	1.6	
0.65	1.39	0.99	1.47	0.53	2.89	1.71	1.74	2.24	1.39	1.6	
0.65	1.39	0.99	1.47	0.53	2.89	1.71	1.74	2.24	1.39	1.6	
0.65	1.39	0.99	1.47	0.53	2.89	1.71	1.74	2.24	1.39	1.6	
1.06	1.64	1.03	1.52	1.3	1.5	1.01	1.11	0.8	0.75	0.9	
1.06	1.64	1.03	1.52	1.3	1.5	1.01	1.11	0.8	0.75	0.9	
1.06	1.64	1.03	1.52	1.3	1.5	1.01	1.11	0.8	0.75	0.9	
1.06	1.64	1.03	1.52	1.3	1.5	1.01	1.11	0.8	0.75	0.9	
2.14	1.25	1.44	1.27	2.98	0.76	1.09	0.59	0.48	0.54	0.49	
0.24	0.07	0.15	0.13	0.24	0.15	0.25		0.22	0.09	0.15	
1.5	1.19	0.89	1.02	1.93	1.18	1.1	1.1	0.9	1.39	1.12	
1.5	1.19	0.89	1.02	1.93	1.18	1.1	1.1	0.9	1.39	1.12	
1.08	0.81	0.91	1.27	1.03	0.95	1.02	1.18	1.31	1.59	1	
1.42	0.86	1.14	1.21	1.21	1.51	1.39	1.12	1.76	1.85	2.17	
0.74	1.08	0.9	0.45	0.58	2.41	1.85	3.16	2.06	2.07	1.96	
0.74	1.08	0.9	0.45	0.58	2.41	1.85	3.16	2.06	2.07	1.96	
0.74	1.08	0.9	0.45	0.58	2.41	1.85	3.16	2.06	2.07	1.96	
1.03	1.14	1.27	1.69	1.23	0.74	1.18	0.95	1.29	1.6	0.87	
0.76	1.47	1.97	1.43	0.53	1.36	1.79	0.76	0.86	1.5	0.97	

FIG.11-12B

1.27	CBLN1	0.59	0.42	2.04	1.09	1.55	0.89	4.42	
1.269444444	TNFSF13	1.69	1.52	1.65	1.02	1.02	1.89	0.69	
1.26	RODH	1.69	1.37	1.85	0.61	0.48	3.04	0.77	
1.255	LRDD v2	0.69	1.22	0.97	1.05	0.95	0.39	0.61	
1.241111111	TNFRSF19 v1	1.03	0.96	1.86	1.45	1.35	0.78	1.99	
1.239444444	GNAS v1	1.07	1.09	1.39	0.48	0.44	1.31	2	
1.236666667	PTPN18	0.82	0.85	0.87	1.21	1.44	1.12	1.1	
1.231111111	EMR2 v1	1.22	1.01	1.13	1.41	1.36	1.16	1.21	
1.211176471	NTT5	1.58	2.04	0.44	0.21	0.26	4.36	0.54	
1.202222222	PTGES2	1.57	1.19	1.84	0.53	0.48	2.14	1.04	
1.198888889	GALR1	1.65	1.39	1.75	0.93	0.8	3.25	0.91	
1.193333333	GPR14	1.32	1.29	0.92	0.46	0.46	1.3	0.51	
1.176111111	TNFSF14	1.88	1.36	0.77	0.43	0.61	2.29	0.92	
1.165	IFNA1	0.68	0.67	1.3	1.32	1.17	0.88	0.8	
1.165	IFNA14	0.68	0.67	1.3	1.32	1.17	0.88	0.8	
1.165	IFNA6	0.68	0.67	1.3	1.32	1.17	0.88	0.8	
1.164444444	IRF7 vC	0.44	0.36	0.57	0.55	0.59	0.32	0.68	
1.163888889	TRIAD3	0.89	0.97	2.06	1.3	1.06	1.27	0.84	
1.157222222	VAMP2	1.01	1.09	3.44	1.22	1.32	1.73	0.99	
1.156666667	SMARCA2 v1	2.52	2	0.49	0.22	0.27	1.9	0.84	
1.156666667	SMARCA2 v2	2.52	2	0.49	0.22	0.27	1.9	0.84	
1.153333333	ARRB1 v1	1.9	1.97	0.83	0.74	0.63	2.02	0.6	
1.153333333	ARRB1 v2	1.9	1.97	0.83	0.74	0.63	2.02	0.6	
1.151666667	TNF	1.39	2.09	1.57	0.54	0.47	1.87	0.75	
1.132777778	GPHN	1.71	1.37	0.49	0.62	0.38	1.4	1.59	
1.131666667	CRH	2.51	2.03	1.82	0.81	0.62	1.83	0.5	
1.127777778	IFNG	2	1.5	0.76	0.79	1.06	1.34	1.7	
1.126666667	IL22RA2	1.08	1.03	1.2	0.75	0.91	0.88	0.97	
1.122222222	CCL24	2.26	2.27	0.81	1.41	0.54	1.62	1.35	
1.118571429	EAF1	1.46	1.05	0.16	0.14	0.15	1.66		

yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

FIG.11-13A

4.13	0.66	0.64	0.74	3.33	0.3	0.37	0.43	0.48	0.44	0.34	
0.65	1.47	1.91	1.31	0.76	1	1.56	0.66	1.27	1.44	1.34	
0.71	1.38	0.73	1.07	0.71	2.45	1.34	1.34	1.33	0.73	1.08	
0.55	0.96	1.09	1.09	0.69	1.7	1.46	1.43	1.23	5.05	1.46	
1.69	0.73	0.97	0.7	1.79	1.01	1.2	1.05	1	1.57	1.21	
2.29	1.04	0.9	0.98	1.7	1.39	1.22	1.05	0.98	1.77	1.21	
0.56	0.92	1.03	1.11	0.58	1.05	1.3	1.16	3.87	2.19	1.08	
0.92	0.83	1.2	1.3	1.4	1.23	1.32	1.36	1.64	1.32	1.14	
0.47	2.92	1.19		0.43	1.21	0.84	1.07	1.18	0.86	0.99	
1.24	1.08	0.93	1.16	0.93	1.85	1.07	1.12	1.32	0.82	1.33	
1.12	1.58	0.85	1.36	0.97	0.93	0.81	0.6	0.94	0.7	1.04	
1.19	1.01	1.06	0.9	0.68	1.6	1.57	1.91	1.56	1.65	2.09	
1.2	1.74	0.65	1.46	0.65	1.47	0.99	1.2	1.29	1.03	1.23	
1.23	0.91	1.13	1.09	1.07	1.41	1.37	1.83	1.25	1.56	1.3	
1.23	0.91	1.13	1.09	1.07	1.41	1.37	1.83	1.25	1.56	1.3	
1.23	0.91	1.13	1.09	1.07	1.41	1.37	1.83	1.25	1.56	1.3	
0.53	0.32	0.49	0.37	0.6	3.38	1.45	6.33	1.48	1.49	1.01	
0.83	0.84	0.99	1.12	0.92	1.31	1.24	0.9	1.59	1.27	1.55	
1.48	0.83	1	0.99	1.38	0.63	0.54	1.05	0.76	0.64	0.73	
1.16	2.64	1.14	1.03	0.8	1.05	0.88	0.79	0.97	0.88	1.24	
1.16	2.64	1.14	1.03	0.8	1.05	0.88	0.79	0.97	0.88	1.24	
0.55	1.77	1.17	1.48	0.68	0.98	1.49	0.85	0.86	1.19	1.05	
0.55	1.77	1.17	1.48	0.68	0.98	1.49	0.85	0.86	1.19	1.05	
1.59	1.57	0.87	1.91	0.78	0.81	0.89	0.59	0.95	1.05	1.04	
1.28	1.9	1.34	1.02	1.79	1.08	1.02	0.78	0.56	0.69	1.37	
1.3	1.23	1.38	1.48	1.42	0.39	0.63	0.61	0.65	0.54	0.62	
2.17	1.4	0.97	1.01	1.71	0.7	0.91	0.56	0.56	0.5	0.66	
0.9	1.32	0.86	1.02	0.97	1.29	1.38	1.22	1.4	1.3	1.8	
1.83	1.28	1.7	1.03	1.01	0.57	0.86	0.37	0.41	0.55	0.33	
	1.36	0.55	0.81		1		2.09	1.61	1.43	2.19	

FIG.11-13B

yes	1.112222222	CD34	0.64	0.79	1.33	0.37	0.58	0.38	0.43
yes	1.107222222	CCR5	1.64	1.77	0.52	0.28	0.19	3.1	0.59
yes	1.105555556	RAMP1	1.6	1.52	1.06	0.77	0.87	1.02	1.41
yes	1.103333333	FCGBP	0.73	1.3	1.19	0.57	0.32	1.35	0.47
yes	1.1	CD38	1.43	1.2	0.61	1.07	1.58	0.76	1.04
yes	1.089444444	IFI35	1.08	1.19	0.83	0.9	0.99	1.05	1.85
yes	1.083888889	SLC18A2	0.92	0.83	0.66	2.59	2.24	0.73	1.78
yes	1.072777778	ACE v1	0.73	1.03	1.3	1.13	0.97	1.09	1.15
yes	1.070555556	SLC25A4	0.44	0.51	0.35	0.18	0.23	0.27	0.25
yes	1.038333333	ANXA8	1.65	1.23	0.53	1.29	1.54	1.23	1.08
yes	1.036666667	IL19	0.56	0.48	0.68	1.52	1.61	0.55	1.44
yes	1.026470588	GRB7	2.08	1.33	0.25	0.3	0.46	1.69	1.6
yes	1.025	CD3D	1.45	1.01	1.1	0.73	0.43	1.27	
yes	1.021111111	GALR2	0.44	0.49	0.48	0.14	0.15	0.32	0.51
yes	1.018333333	CASP4 va	1.22	1.09	0.7	1.31	1.61	1.07	0.75
yes	1.018333333	CASP4 vc	1.22	1.09	0.7	1.31	1.61	1.07	0.75
yes	1.018333333	CASP4 vd	1.22	1.09	0.7	1.31	1.61	1.07	0.75
yes	1.017777778	TRIP	0.91	0.67	0.79	2.72	2.47	0.98	1.36
yes	1.015555556	C1QB	1.03	1.08	1.73	0.89	0.99	0.75	0.86
yes	1.011111111	TIMP3	1.46	0.84	0.61	0.34	0.66	1.17	1.26
yes	1.01	TLR2	0.54	0.55	0.34	0.27	0.31	0.41	0.34
yes	1.000555556	CSF3	0.94	1.07	2.12	0.81	1	1.07	0.54
yes	0.998823529	PIGR	1.45	1.14	1.48	1.54	1.21	1.52	1.83
yes	0.993333333	IL15RA	1.01	1.03	0.56	0.45	0.6	0.91	0.41
yes	0.989444444	POLE4	0.89	0.72	0.42	3.51	2.01	0.92	0.88
yes	0.987222222	ALDH1B1	0.73	0.87	1.27	1.13	1.06	1.53	1.03
yes	0.982222222	TANK v1	0.49	0.52	1.83	1.89	1.22	0.52	1.49
yes	0.962777778	CLOCK	0.94	1.05	2.08	0.75	0.96	1.18	0.61
yes	0.955	THPO	0.85	0.82	1.37	1.26	1.3	1.53	0.92
yes	0.953333333	MADD v1	0.67	0.61	1.12	1.5	1.44	1.13	0.77

FIG.11-14A

0.38	0.94	0.53	0.61	0.34	1.92	2.15	1.77	2.2	2.09	2.57		
0.76	1.88	0.96	1.41	0.56	1.3	0.96	1.06	0.85	0.96	1.14		
0.93	1.43	1.69	1.62	1.04	0.84	1	0.72	0.68	0.71	0.99		
0.44	0.48	0.75	0.66	0.5	3.03	1.76	3.74	0.78	1.12	0.67		
1.3	1.35	1.17	0.94	1.35	1.27	1.04	0.9	0.75	1.04	1		
1.58	0.88	0.96	0.9	1.11	1.18	0.93	1.29	1.03	0.97	0.89		
1.65	0.75	1.03	0.87	1.86	0.67	0.71	0.57	0.46	0.67	0.52		
0.99	1	2.35	1.42	0.81	0.68	0.96	1.21	1.11	0.6	0.78		
0.21	0.5	0.45	0.38	0.22	2.26	3.14	2.08	2.68	1.45	3.67		
1.52	1.48	0.83	0.77	1.36	0.61	0.92	0.49	0.68	0.72	0.76		
1.4	0.52	0.57	0.54	1.6	1.03	1.34	1.45	1.33	0.94	1.1		
1.3		1.21	1.64	0.95	0.99	0.8	0.48	0.71	0.67	0.99		
	0.93	0.94	1.06			0.83	1.02	1.29	1.26	1.03		
0.68	0.44	0.53	0.43	0.46	2.91	1.98	1.59	2.02	1.97	2.84		
0.81	0.88	0.88	1.04	1.34	1.01	0.93	0.84	1.12	0.79	0.94		
0.81	0.88	0.88	1.04	1.34	1.01	0.93	0.84	1.12	0.79	0.94		
0.81	0.88	0.88	1.04	1.34	1.01	0.93	0.84	1.12	0.79	0.94		
1.57	0.81	0.76	0.83	1.91	0.72	0.48	0.29	0.42	0.34	0.29		
0.86	1.07	0.88	1.33	0.88	0.9	0.88	0.81	0.98	1.41	0.95		
1.96	1.92	0.96	1.36	1.01	0.64	0.75	0.9	0.63	0.74	0.99		
0.81	0.62	0.93	0.52	0.72	1.2	1.62	0.94	4.57	1.15	2.34		
0.79	0.86	0.95	1.09	0.84	1.12	0.79	1.08	1.48	0.74	0.72		
2.28	1.61	0.81		1.45	0.11	0.18	0.13	0.08	0.09	0.07		
0.47	0.89	0.67	0.9	0.55	1.38	1.57	1.24	1.64	1.97	1.63		
1.38	0.75	0.78	0.68	1.54	0.52	0.71	0.37	0.62	0.55	0.56		
1.03	0.72	1.51	1.02	0.88	0.6	0.57	1.33	1.21	0.63	0.65		
1.04	0.64	0.83	1.02	1.28	0.57	0.67	0.91	1.11	1.03	0.62		
0.76	0.82	1.05	1.11	0.82	0.98	0.76	0.83	1.06	0.79	0.78		
0.92	0.96	1.08	1.31	1.1	0.55	0.59	0.44	0.68	0.65	0.86		
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09		

FIG.11-14B

0.953333333	MADD v2	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.953333333	MADD v3	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.953333333	MADD v4	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.953333333	MADD v5	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.953333333	MADD v6	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.953333333	MADD v7	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.953333333	MADD v8	0.67	0.61	1.12	1.5	1.44	1.13	0.77	yes
0.945555556	CYP46	0.73	0.78	1.38	1.33	0.97	1.14	1	yes
0.943333333	FCGRT	0.46	0.43	1.17	0.69	1.07	0.54	2.12	yes
0.93	HSD17B1	0.95	1.11	0.78	0.88	0.82	1.84	0.9	yes
0.927777778	SLC6A13	0.9	1.15	1.2	0.76	0.65	0.76	0.91	yes
0.920555556	LST1	0.84	0.84	0.61	0.58	0.57	0.76	0.42	yes
0.919444444	WASF1	0.73	0.86	0.44	0.79	0.84	0.81	0.56	yes
0.918125	ADA	1.05	0.8	0.93	1.02	1.02	0.92	1.41	yes
0.918125	ADA	1.05	0.8	0.93	1.02	1.02	0.92	1.41	yes
0.918125	ADA	1.05	0.8	0.93	1.02	1.02	0.92	1.41	yes
0.918125	ADA	1.05	0.8	0.93	1.02	1.02	0.92	1.41	yes
0.912222222	ELK1	0.48	0.8	0.55	0.56	0.36	1.26	0.65	yes
0.905294118	NOS1	0.92	1		0.69	0.57	1.04	0.54	yes
0.893333333	CASP10 vB	0.71	0.73	0.91	0.7	0.72	1.21	0.46	yes
0.889411765	GABRG3	1.14	1.03	0.99	0.55	0.53	1.35	0.51	yes
0.886666667	TNFSF5	0.88	0.89	0.81	0.72	0.79	0.55	1.34	yes
0.886666667	CCL21	1.16	0.97	0.94	0.93	0.83	0.52	1.68	yes
0.882222222	NR2F1	0.63	0.92	0.4	0.27	0.5	0.51	0.3	yes
0.88	HLA-DRA	0.14	0.15	0.22	0.11	0.12	0.21	0.15	yes
0.876666667	LTA4H	0.36	0.36	1.1	2.1	2.47	0.37	1.65	yes
0.87444444	NR5A1	0.86	0.9	0.79	0.33	0.31	0.96	0.38	yes
0.871176471	HSD17B3	1.31	1.32	0.31	0.24	0.24	2.67	0.71	yes
0.87	GDF10	0.9	0.91	1.69	1.2	0.85	0.81	0.93	yes
0.863333333	GAD1 vGAD25	0.67	0.76	1.19	1.51	0.73	0.54	0.71	yes

FIG.11-15A

0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
0.55	0.83	0.74	0.89	0.85	1.07	1.02	0.85	0.89	1.14	1.09
1.06	0.77	1.04	1.14	1.48	0.6	0.76	0.64	0.81	0.61	0.78
1.83	0.49	0.66	0.49	2.03	0.89	0.82	0.98	0.62	1.04	0.65
0.61	0.82	0.89	1.49	0.55	0.69	0.75	1.07	1.03	0.84	0.72
0.63	0.74	1.1	0.91	0.83	1.1	0.96	0.94	0.85	1.33	0.98
0.95	1.03	1.28	1.03	1.17	1.15	1.06	1.01	0.79	1.2	1.28
0.49	1.35	2.03	1.03	0.4	0.78	1.14	1.02	1.13	0.91	1.24
1.54	0.76	0.81	0.86	1.26		0.82	0.71	0.41		0.37
1.54	0.76	0.81	0.86	1.26		0.82	0.71	0.41		0.37
1.54	0.76	0.81	0.86	1.26		0.82	0.71	0.41		0.37
1.54	0.76	0.81	0.86	1.26		0.82	0.71	0.41		0.37
0.52	0.66	2.42	0.78	0.31	1.08	1.29	1.37	1.41	0.89	1.03
0.42	0.96	1.02	1.15	0.6	1.4	0.92	0.74	1.36	1.02	1.04
0.75	0.59	0.94	0.58	0.6	1.07	0.97	1.54	0.98	1.26	1.36
	0.88	0.93	0.66	0.61	0.89	0.88	1.06	0.92	0.94	1.25
0.85	0.93	1.32	0.93	0.91	0.81	0.95	0.73	0.84	1.14	0.57
1.53	0.66	0.73	0.75	1.98	0.54	0.58	0.53	0.52	0.58	0.53
0.36	0.81	1.14	1.05	0.25	1.16	1.7	1.57	1.44	1.54	1.33
0.17	0.09	0.16	0.15	0.2		3.41	3.36	3.46	1.09	1.77
1.5	0.36	0.45	0.31	1.59	0.48	0.61	0.5	0.55	0.45	0.57
0.28	0.62	0.53	0.89	0.37	0.53	1.98	2.55	1.98	0.57	0.91
0.8	1.75	0.71	1.29	0.79	0.69	0.51		0.48	0.54	0.45
0.99	0.9	0.93	1.1	0.77	0.67	0.61	0.55	0.77	0.52	0.56
0.58	0.74	0.69	0.65	0.78	0.76	1.24	0.86	0.89	1.11	1.13

FIG.11-15B

0.863333333	GAD1 vGAD67	0.67	0.76	1.19	1.51	0.73	0.54	0.71	
0.855555556	OXTR	0.82	0.78	0.73	0.84	0.87	0.92	1.07	
0.855555556	IL2RB	0.64	0.61	1.13	0.62	0.75	0.47	1.46	
0.851111111	SSBP1	0.69	0.68	0.42	0.37	0.35	0.51	0.57	
0.85	CHAT vN	1.19	0.74	1.06	0.81	1.23	1.29	1.12	
0.85	CHAT vN1	1.19	0.74	1.06	0.81	1.23	1.29	1.12	
0.85	CHAT vN2	1.19	0.74	1.06	0.81	1.23	1.29	1.12	
0.85	CHAT vR	1.19	0.74	1.06	0.81	1.23	1.29	1.12	
0.849444444	IL10RB	0.75	0.79	0.91	1.05	0.8	0.47	1.52	
0.844444444	PLA2G1B	0.59	0.5	0.85	2.25	1.86	0.74	0.86	
0.843333333	ICAM2	0.98	1.08	0.6	0.4	0.38	1.03	1.05	
0.841666667	MGST3	1.06	1.25	0.49	0.64	0.51	0.45	0.53	
0.838333333	INSR	0.53	0.51	0.32	1.32	1.42	0.5	0.83	
0.836111111	HLA-A	0.7	0.79	0.49	0.77	0.58	0.59	1.3	
0.832857143	EMR3 v1	0.75	1.14	0.67	0.42	0.41	2.11	0.64	
0.832777778	SLC6A14	0.55	0.53	0.74	1.18	2.21	0.43	1.6	
0.831666667	IL17	0.59	0.64	1.27	1.31	1.12	0.67	0.93	
0.82444444	PDGFRA	1.33	1.16	0.62	0.36	0.3	1.47	0.74	
0.822777778	KLK1	0.29	0.31	0.49	0.77	0.67	0.26	0.59	
0.821111111	GNRH1	1.13	1.04	0.57	0.94	1.48	0.81	0.43	
0.817777778	HRH3	0.81	0.78	0.97	0.75	0.69	1.51	0.75	
0.815	CARD10	0.4	0.43	0.84	1.16	1.82	0.95	1.45	
0.815	NR6A1 v1	0.64	0.67	0.62	0.69	0.53	1.07	0.7	
0.814444444	ZFP36L1	0.52	0.6	1.31	0.78	0.55	0.57	1	
0.812777778	PREB	0.9	1.06	0.79	0.83	0.79	0.56	1.1	
0.808666667	RTN3	1.35	0.99	0.72	0.31	0.27	2.22		
0.805555556	CYP4F8	0.8	0.73	0.81	0.86	0.89	1.11	0.71	
0.798888889	STX1A	0.79	0.8	1.48	1.01	1.59	0.72	1.14	
0.797777778	BRE	0.16	0.31	0.73	1.94	1.43	0.35	1.03	
0.783333333	CTSW	0.98	2.31	0.59	0.34	0.27	1.72	0.52	

FIG.11-16A

0.58	0.74	0.69	0.65	0.78	0.76	1.24	0.86	0.89	1.11	1.13	
0.65	0.76	1.19	1.1	0.68	0.56	0.86	1.04	1.08	0.76	0.69	
1.69	0.48	0.68	0.56	1.06	0.96	0.82	0.86	0.94	0.71	0.96	
0.57	0.8	0.6	0.58	0.57	1.37	1.94	0.95	1.23	1.43	1.69	
1.1	0.85	0.51	0.83	1.25	0.98	0.44	0.49	0.4	0.55	0.46	
1.1	0.85	0.51	0.83	1.25	0.98	0.44	0.49	0.4	0.55	0.46	
1.1	0.85	0.51	0.83	1.25	0.98	0.44	0.49	0.4	0.55	0.46	
0.89	1	1.1	0.98	0.93	0.62	0.9	0.8	0.52	0.51	0.75	
1.09	0.55	0.67	0.67	1.41	0.49	0.58	0.36	0.72	0.47	0.54	
1.04	0.85	0.88	0.75	0.78	0.62	1	1.16	0.74	1.21	0.63	
0.53	1.72	1.5	1.11	0.47	0.79	0.89	0.67	0.66	0.99	0.89	
0.87	0.67	1.16	0.84	1.67	0.86	0.72	0.68	0.82	1	0.37	
0.92	0.68	0.87	0.9	0.71	1.18	1.01	0.58	1	0.92	1.06	
	1.11	0.58	0.94		0.54	0.86			0.94	0.55	
1.42	0.56	0.68	0.47	1.17	0.57	0.6	0.6	0.57	0.48	0.63	
0.64	0.67	0.85	0.96	0.84	0.52	0.7	0.63	0.93	0.97	0.73	
1.03	1.12	0.67	0.81	0.79	0.81	0.92	0.57	0.62	0.68	0.84	
0.69	0.32	0.37	0.29	0.56	1.39	1.69	1.25	1.6	1.26	2.01	
1.3	0.82	0.97	0.76	1.17	0.5	0.67	0.51	0.32	0.85	0.51	
0.69	0.92	0.79	1.09	0.72	0.85	0.6	0.75	0.45	0.97	0.63	
1.19	0.41	0.52	0.59	1.68	0.7	0.48	0.62	0.63	0.47	0.33	
0.6	0.57	0.85	0.89	0.61	0.92	0.87	1.18	1.12	1.1	1.04	
0.87	0.37	0.5	0.54	0.82	1.08	0.91	0.86	1.19	1.09	1.1	
0.6	1.24	1.37	1.18	0.61	0.42	0.57	1.01	0.56	0.61	0.43	
	0.9	0.73	0.85		2.14	0.51	0.37	0.26	0.28	0.23	
0.57	0.72	0.83	1.13	0.77	0.72	0.8	0.79	0.8	0.68	0.78	
0.69	0.7	0.76	0.95	1.05	0.65	0.44	0.36	0.4	0.45	0.4	
1.98	0.19	0.32	0.32	1.62	0.75	0.62	0.64	0.84	0.69	0.44	
0.34	0.65	1	2.88	0.32	0.41	0.36	0.51	0.29	0.32	0.29	

FIG.11-16B

0.778888889	MC3R	0.95	0.95	0.86	0.86	1	1.58	0.92
0.773888889	HTR3B	0.57	0.69	1.37	1.38	0.8	0.52	0.83
0.766111111	NR1H3	0.69	0.82	0.69	0.49	0.34	0.77	0.68
0.763333333	IL12B	1.23	1	1.23	0.59	0.62	1.44	0.65
0.762777778	SERPINA6	0.24	0.25	0.39	0.19	0.17	0.22	0.27
0.756111111	CNTFR v1	0.33	0.3	0.19	0.28	0.41	0.38	0.24
0.756111111	CNTFR v2	0.33	0.3	0.19	0.28	0.41	0.38	0.24
0.748333333	PNMT	0.56	0.83	0.54	0.67	0.52	0.93	0.48
0.742222222	TCIRG1 v1	0.49	0.62	0.6	0.38	0.33	0.55	0.39
0.742222222	TCIRG1 v2	0.49	0.62	0.6	0.38	0.33	0.55	0.39
0.741176471	PTX3	0.36	0.34	0.85		1.93	0.3	1.34
0.739444444	MC1R	0.63	0.77	0.68	0.85	0.79	0.66	0.38
0.736666667	BCL2L2	0.96	1.27	0.83	0.63	0.47	0.79	0.38
0.735555556	EPO	0.5	0.58	0.85	0.82	0.83	0.56	0.5
0.735294118	HOXB1	0.89	0.74	1.35	0.45	0.54	0.68	0.75
0.723888889	ETS1	0.98	0.91	0.77	0.65	0.56	0.8	0.79
0.723888889	MAOA	0.61	0.66	0.64	0.74	0.88	0.54	0.55
0.717777778	PF4	0.47	0.71	1.25	1.11	0.99	0.92	0.74
0.716111111	IGF2	0.55	0.78	0.4	0.2	0.33	0.61	0.21
0.712222222	CD69	0.57	0.62	0.4	1.15	1.91	1.16	0.73
0.711333333	CD3E	0.13	0.1	0.09	0.02	0.03	0.19	
0.709444444	ICAM3	0.95	0.63	1.18	0.45	0.5	1.27	0.52
0.705	FUS	0.95	0.61	0.79	0.62	0.49	0.74	0.93
0.704444444	PRLR	0.62	0.66	1.24	0.89	0.65	0.79	0.54
0.701111111	HSP105B	0.46	0.42	0.58	0.86	1.06	0.3	1.14
0.700588235	TLR6	0.71	0.63	0.16	0.04	0.05	0.65	
0.697222222	NROB2	0.4	0.58	0.79	0.85	0.58	0.35	0.73
0.691666667	SIGLEC6	0.34	0.43	0.73	1.43	1.02	0.39	0.57
0.690555556	PTGDS	0.7	0.83	0.59	0.6	0.71	1.57	0.47
0.69	MAOB	0.51	0.6	1.55	0.82	0.73	0.54	0.53

FIG.11-17A

0.62	0.76	0.85	1.02	0.54	0.36	0.5	0.58	0.49	0.77	0.41	
0.63	0.75	0.87	0.84	0.77	0.62	0.53	0.74	0.63	0.73	0.66	
0.63	0.77	0.64	0.68	0.6	0.96	1.05	0.79	0.89	1.43	0.87	
0.69	0.9	0.61	0.79	0.61	0.69	0.46	0.63	0.72	0.34	0.54	
0.27	0.21	0.26	0.23	0.29	2.6	1.52	2.76	1.4	1.45	1.01	
0.24	0.3	0.33	0.66	0.26	1.58	1.57	1.5	1.35	1.59	2.1	
0.24	0.3	0.33	0.66	0.26	1.58	1.57	1.5	1.35	1.59	2.1	
0.42	0.74	0.83	0.91	0.33	0.78	0.88	0.99	1.29	1.07	0.7	
0.27	0.41	0.54	0.5	0.34	1.44	0.91	2.28	0.86	1.6	0.85	
0.27	0.41	0.54	0.5	0.34	1.44	0.91	2.28	0.86	1.6	0.85	
1.32	0.46	0.43	0.4	1.29	0.91	0.54	0.72	0.53	0.39	0.49	
0.4	0.73	1.16	1.04	0.32	0.6	0.67	1.24	1.13	0.57	0.69	
0.43	1	0.95	1.05	0.55	0.62	0.81	0.69	0.55	0.67	0.61	
0.47	0.58	0.73	0.68	0.41	0.94	0.92	1.02	1.15	0.82	0.88	
1.13	0.8	0.51	0.47	0.86	0.69	0.6		0.77	0.58	0.69	
0.68	0.7	0.83	0.81	0.71	0.67	0.68	0.6	0.71	0.4	0.78	
0.43	0.78	1.64	0.82	0.49	0.63	0.66	0.97	0.69	0.54	0.76	
0.6	0.55	0.51	0.72	0.93	1.09	0.48	0.42	0.42	0.62	0.39	
0.27	0.68	0.8	0.72	0.21	1.65	1.17	1.57	0.95	0.94	0.85	
0.77	0.55	0.68	0.58	1.2	0.34	0.58	0.36	0.42	0.46	0.34	
	0.09	0.07	0.08		0.24	2.15	2.31	1.83	1.62	1.72	
0.63	0.58	0.54	0.8	0.6	0.83	0.7	0.69	0.48	0.59	0.83	
1.71	0.5	0.58	0.43	1.23	0.72	0.57	0.57	0.46	0.42	0.37	
0.52	0.5	0.67	0.68	0.74	0.78	0.52	0.78	0.53	1.12	0.45	
0.8	0.33	0.57	0.34	0.86	0.72	0.96	0.81	0.68	0.96	0.77	
0.09	0.48	0.62	0.47	0.41	0.48	0.62	4.95	0.56	0.43	0.56	
0.54	0.51	0.81	0.69	0.49	0.85	0.88	1.05	0.84	0.6	1.01	
0.47	0.52	0.68	0.58	0.53	0.72	0.82	0.85	0.72	0.9	0.75	
0.36	0.75	0.74	0.72	0.36	0.64	0.87	0.56	0.55	0.69	0.72	
0.54	0.73	0.56	0.78	0.54	0.51	0.7	0.57	0.87	0.64	0.7	

FIG.11-17B

yes	0.685555556	C1QBP	0.62	0.72	0.55	0.61	0.48	0.51	0.4
yes	0.684444444	CCL28 v1	0.39	0.64	0.66	1.38	1.18	0.72	0.77
yes	0.682777778	PIAS1	0.88	0.86	0.54	0.41	0.38	1.47	0.47
yes	0.68	RFX2 v1	0.44	0.48	0.38	0.56	1.01	0.86	0.72
yes	0.676	CHRNA6	0.19	0.1	0.32	0.04	0.04	0.23	
yes	0.675882353	IGFBP3	0.42	0.54	1.01	1.04	0.69	0.5	0.54
	0.673888889	ADAM8	0.6	0.75	0.94	0.4	0.36	0.53	0.61
	0.673888889	CCL27	0.7	0.69	1	0.74	0.54	0.84	0.71
yes	0.669444444	LTB4R	0.5	0.6	0.37	0.27	0.26	1.1	0.44
yes	0.668888889	IGFBP6	0.96	1	0.18	0.05	0.07	1.91	0.32
yes	0.668823529	ADRB1	0.58	0.56		0.2	0.21	0.46	0.66
yes	0.663888889	SR-BP1 v3	0.78	0.76	0.65	0.59	0.7	1.08	0.63
yes	0.663888889	SR-BP1 v4	0.78	0.76	0.65	0.59	0.7	1.08	0.63
yes	0.663888889	SR-BP1 v5	0.78	0.76	0.65	0.59	0.7	1.08	0.63
yes	0.660555556	BID	0.45	0.42	1.11	1.68	1.78	0.88	0.59
yes	0.659333333	ADRBK1	0.49	0.78	0.44	0.17	0.15	0.53	
yes	0.657777778	LOC55971	0.8	0.78	0.63	0.9	1.24	1.46	0.47
yes	0.655555556	PTPN1	0.62	0.62	0.56	0.47	0.61	0.82	0.36
yes	0.641666667	IL20RA	0.93	0.91	0.31	0.09	0.12	0.81	0.26
yes	0.640555556	ICAM4 v1	0.82	0.98	1.01	0.3	0.22	1.23	0.42
yes	0.640555556	ICAM4 v2	0.82	0.98	1.01	0.3	0.22	1.23	0.42
yes	0.639444444	CCBP2	0.3	0.3	0.54	1.13	1.53	0.35	1.18
	0.637777778	BATF	0.58	0.56	0.85	0.89	0.67	0.65	0.88
yes	0.633529412	ZNF14	0.73	0.7	0.26	0.37	0.4	1.03	
yes	0.632222222	IL8Ra	0.35	0.41	0.87	1.93	1.41	0.39	0.52
	0.630588235	IFI30	0.44	0.49	0.59	0.65	0.61	0.38	0.69
	0.628888889	SLC25A3 va	0.72	0.72	0.29	0.84	0.86	0.76	0.8
yes	0.622222222	GPR2	0.52	0.65	1.03	0.41	0.37	0.78	0.37
	0.621666667	NTRK3	0.6	0.62	0.79	0.25	0.25	0.69	0.39
yes	0.621111111	PTPN9	0.29	0.57	0.39	0.22	0.24	0.42	0.35

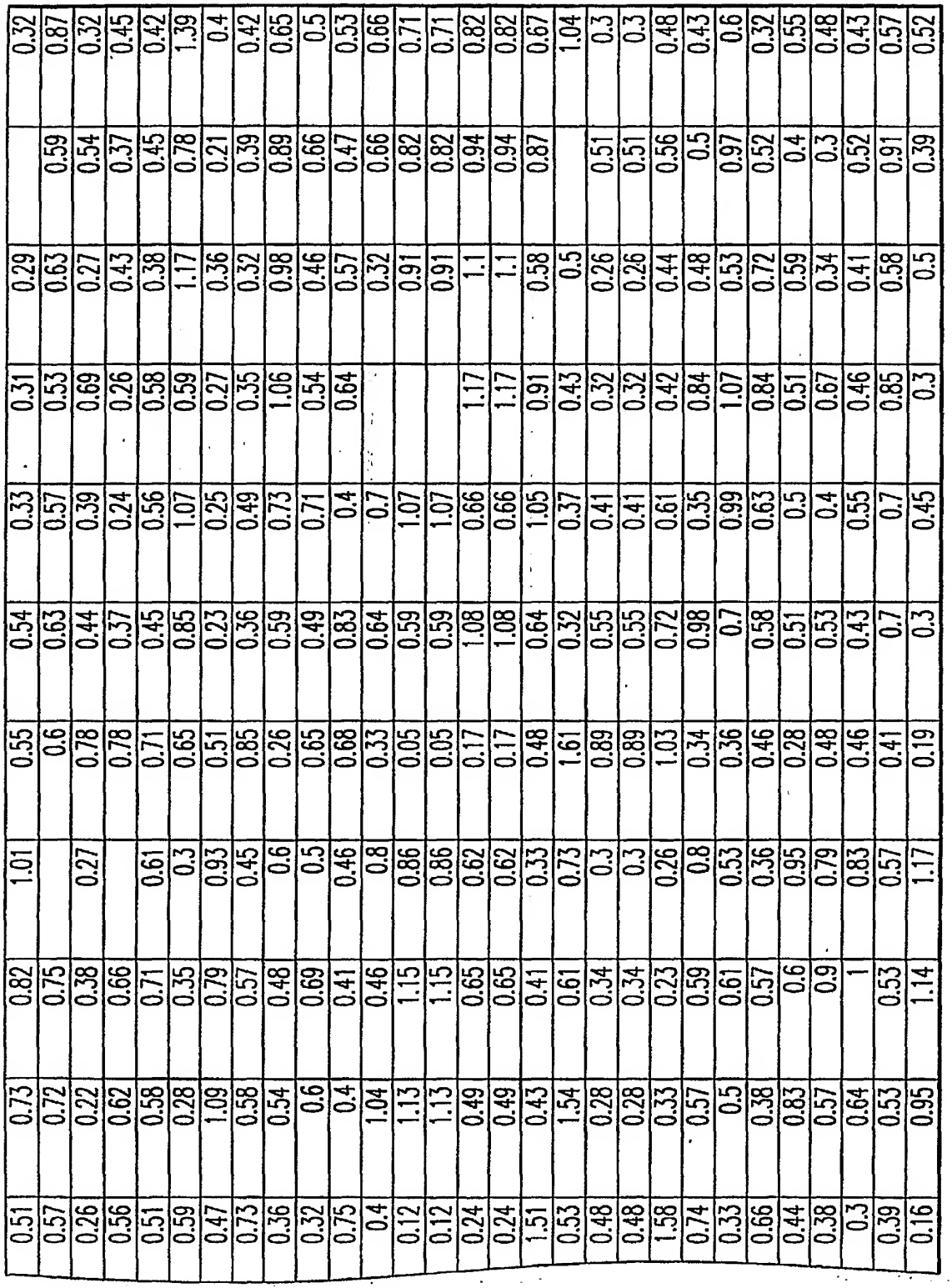
FIG.11-18A

0.4	0.73	0.65	0.72	0.4	1.07	0.89	0.79	0.77	1.27	0.76
0.88	0.9	0.79	0.67	1.12	0.24	0.36	0.32	0.36	0.53	0.41
0.62	1.22	0.59	1.12	0.37	0.65	0.57	0.44	0.6	0.47	0.63
0.4	0.77	0.61	0.62	0.97	0.75	0.94	0.9	0.39	0.86	0.58
	0.11	0.07	0.09		0.31	1.74	1.54	1.66	2.33	1.37
0.59	0.44	0.67		0.63	0.61	0.83	0.97	0.68	0.61	0.72
0.62	0.61	0.53	0.56	0.63	0.88	0.81	0.8	0.9	0.87	0.73
0.57	0.57	0.79	0.75	0.71	0.64	0.5	0.57	0.64	0.49	0.68
0.54	0.82	0.51	0.89	0.32	0.64	0.54	0.99	1.72	0.59	0.95
0.27	1.26	0.54	0.99	0.18	0.98	0.62	0.99	0.61	0.48	0.63
0.89	0.73	0.71	0.68	0.81	0.75	1.19	0.62	0.69	0.78	0.85
0.57	0.71	0.54	0.92	0.39	0.45	0.64	0.77	0.7	0.6	0.47
0.57	0.71	0.54	0.92	0.39	0.45	0.64	0.77	0.7	0.6	0.47
0.57	0.71	0.54	0.92	0.39	0.45	0.64	0.77	0.7	0.6	0.47
0.48	0.5	0.63	0.4	0.95	0.3	0.52	0.29	0.23	0.31	0.37
	0.41	0.58	0.77		1.1	0.99	1.01	0.97	0.92	0.58
0.38	1	0.48	0.77	0.39	0.33	0.51	0.56	0.35	0.38	0.41
0.54	0.44	0.42	0.59	0.52	0.95	1	0.57	1.01	0.84	0.86
0.2	0.75	0.68	1.24	0.19	1.01	0.69	0.9	0.99	0.6	0.87
0.45	0.95	0.48	0.63	0.45	0.87	0.55	0.55	0.57	0.51	0.54
0.45	0.95	0.48	0.63	0.45	0.87	0.55	0.55	0.57	0.51	0.54
1.49	0.31	0.27	0.27	1.17	0.68	0.41	0.66	0.34	0.3	0.28
0.78	0.39	0.57	0.51	0.9	0.54	0.51	0.44	0.56	0.57	0.63
0.77	0.74	0.61	0.52	0.54	0.61	0.77	0.87	0.63	0.66	0.56
0.44	0.57	0.71	0.72	0.55	0.6	0.33	0.59	0.37	0.3	0.32
0.83	0.55	0.56	0.43	0.52	0.97	0.71		0.82	0.63	0.85
0.89	0.95	0.61	0.8	0.65	0.39	0.53	0.41	0.24	0.48	0.38
0.48	0.61	0.61	0.77	0.38	0.94	0.52	0.65	0.84	0.61	0.66
0.33	0.53	0.62	0.78	0.35	0.72	0.85	0.9	0.96	0.74	0.82
0.62	0.82	0.3	0.23	0.65	1.05	1.56	0.96	0.73	0.79	0.99

FIG.11-18B

0.615294118	FOXP3	0.58	0.77	0.87	0.8	0.66	0.7	0.67		yes
0.615294118	CHRHR	0.92	0.97	0.52	0.13	0.26	0.79	0.41		
0.606111111	MAPK1	0.16	0.15	0.43	1.73	2.49	0.89	0.5		yes
0.603529412	KLF16	0.88	0.83	1.3	0.66	0.51	0.61	0.73		yes
0.603333333	IRAK1	0.8	0.76	0.83	0.83	0.63	0.48	0.57		
0.602222222	OSM	0.41	0.32	0.53	0.25	0.16	0.46	0.69		yes
0.601666667	NGFB	1.02	0.96	0.61	0.31	0.32	1.63	0.47		yes
0.601111111	IFIT1	0.68	0.49	0.44	1.49	0.97	0.59	0.65		yes
0.59944444	MC5R	0.32	0.36	0.51	0.93	0.6	0.44	0.49		yes
0.598888889	CCL8	0.29	0.38	0.71	0.72	1.16	0.82	0.58		yes
0.597222222	TOLLIP	0.51	0.48	1.1	0.79	0.56	0.57	0.6		yes
0.597058824	IL1F6	0.83	0.85	0.39	0.16	0.15	1.4	0.36		yes
0.596875	FCGR3A	0.56	0.83		0.04	0.05	0.57	0.09		yes
0.596875	FCGR3B	0.56	0.83		0.04	0.05	0.57	0.09		yes
0.594444444	CRHR1	0.51	0.72	0.54	0.13	0.19	0.53	0.14		yes
0.594444444	CRHR2	0.51	0.72	0.54	0.13	0.19	0.53	0.14		yes
0.590555556	GFRA3	0.33	0.78	0.29	0.13	0.15	0.54	0.53		yes
0.59	IL8	0.26	0.32	0.44	0.15	0.34	0.48	0.36		yes
0.588888889	NFX1 v1	0.27	0.28	0.54	1.41	2.03	0.95	0.48		yes
0.588888889	NFX1 v2	0.27	0.28	0.54	1.41	2.03	0.95	0.48		yes
0.587777778	CD1E	0.52	0.38	0.86	0.22	0.34	0.52	1.08		yes
0.587222222	C2	0.57	0.62	0.61	0.29	0.39	0.91	0.56		
0.583333333	GPR49	0.39	0.43	0.46	0.82	0.6	0.28	0.33		yes
0.583333333	IL1A	0.78	0.85	0.46	0.35	0.33	0.87	0.82		yes
0.583333333	STAT5A	0.65	0.65	0.5	0.47	0.5	1.19	0.38		
0.582222222	CYP2J2	0.46	0.77	0.78	0.65	0.67	0.73	0.58		yes
0.577777778	GRM1	0.62	0.72	0.72	0.85	0.74	0.55	0.17		
0.576666667	MASP1 v1	0.59	0.68	0.59	0.27	0.23	0.94	0.34		yes
0.569444444	NFIL3	1.18	1.2	0.19	0.04	0.09	1.31	0.17		yes

FIG.11-19A



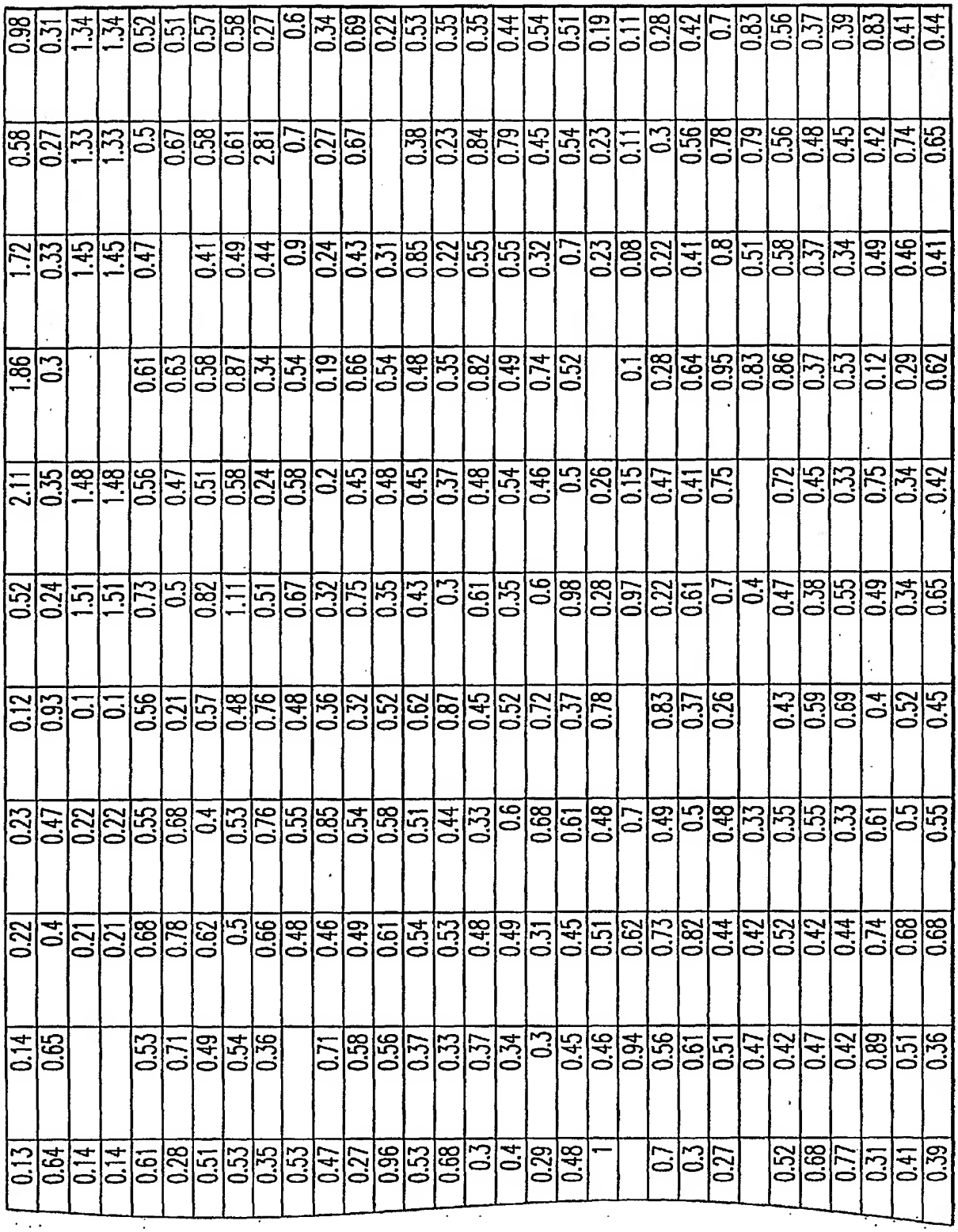
0.51	0.73	0.82	1.01	0.55	0.54	0.33	0.31	0.29		0.32
0.57	0.72	0.75		0.6	0.63	0.57	0.53	0.63	0.59	0.87
0.26	0.22	0.38	0.27	0.78	0.44	0.39	0.69	0.27	0.54	0.32
0.56	0.62	0.66		0.78	0.37	0.24	0.26	0.43	0.37	0.45
0.51	0.58	0.71	0.61	0.71	0.45	0.56	0.58	0.38	0.45	0.42
0.59	0.28	0.35	0.3	0.65	0.85	1.07	0.59	1.17	0.78	1.39
0.47	1.09	0.79	0.93	0.51	0.23	0.25	0.27	0.36	0.21	0.4
0.73	0.58	0.57	0.45	0.85	0.36	0.49	0.35	0.32	0.39	0.42
0.36	0.54	0.48	0.6	0.26	0.59	0.73	1.06	0.98	0.89	0.65
0.32	0.6	0.69	0.5	0.65	0.49	0.71	0.54	0.46	0.66	0.5
0.75	0.4	0.41	0.46	0.68	0.83	0.4	0.64	0.57	0.47	0.53
0.4	1.04	0.46	0.8	0.33	0.64	0.7		0.32	0.66	0.66
0.12	1.13	1.15	0.86	0.05	0.59	1.07		0.91	0.82	0.71
0.12	1.13	1.15	0.86	0.05	0.59	1.07		0.91	0.82	0.71
0.24	0.49	0.65	0.62	0.17	1.08	0.66	1.17	1.1	0.94	0.82
0.24	0.49	0.65	0.62	0.17	1.08	0.66	1.17	1.1	0.94	0.82
1.51	0.43	0.41	0.33	0.48	0.64	1.05	0.91	0.58	0.87	0.67
0.53	1.54	0.61	0.73	1.61	0.32	0.37	0.43	0.5		1.04
0.48	0.28	0.34	0.3	0.89	0.55	0.41	0.32	0.26	0.51	0.3
0.48	0.28	0.34	0.3	0.89	0.55	0.41	0.32	0.26	0.51	0.3
1.58	0.33	0.23	0.26	1.03	0.72	0.61	0.42	0.44	0.56	0.48
0.74	0.57	0.59	0.8	0.34	0.98	0.35	0.84	0.48	0.5	0.43
0.33	0.5	0.61	0.53	0.36	0.7	0.99	1.07	0.53	0.97	0.6
0.66	0.38	0.57	0.36	0.46	0.58	0.63	0.84	0.72	0.52	0.32
0.44	0.83	0.6	0.95	0.28	0.51	0.5	0.51	0.59	0.4	0.55
0.38	0.57	0.9	0.79	0.48	0.53	0.4	0.67	0.34	0.3	0.48
0.3	0.64	1	0.83	0.46	0.43	0.55	0.46	0.41	0.52	0.43
0.39	0.53	0.53	0.57	0.41	0.7	0.7	0.85	0.58	0.91	0.57
0.16	0.95	1.14	1.17	0.19	0.3	0.45	0.3	0.5	0.39	0.52

FIG.11-19B

0.566666667	CACNB3	0.21	0.26	0.3	0.21	0.12	0.35	0.14	
0.563888889	CYP2E1	0.33	0.34	1.34	0.94	0.87	0.47	0.97	
0.554375	SYN1 v1a	0.21	0.24	0.11	0.09	0.12	0.17	0.15	
0.554375	SYN1 v1b	0.21	0.24	0.11	0.09	0.12	0.17	0.15	
0.553888889	PSPN	0.51	0.44	0.79	0.47	0.46	0.5	0.48	
0.552941176	VIPR1	0.76	0.78	0.49	0.45	0.45	0.69	0.34	
0.552777778	AVPR2	0.43	0.47	0.71	0.6	0.79	0.3	0.59	
0.548333333	B2M	0.59	0.46	0.37	0.26	0.45	0.33	0.59	
0.548333333	TEC	0.36	0.3	0.15	0.41	0.42	0.36	0.37	
0.548235294	HSPCA	0.51	0.62	0.47	0.37	0.25	0.66	0.41	
0.542222222	MST1R	1.05	0.9	0.37	0.18	0.17	2.35	0.33	
0.541666667	RORC	0.67	0.73	0.58	0.33	0.19	1.03	0.37	
0.540588235	GH2 v2	0.81	0.58	0.44	0.36	0.41	0.81	0.65	
0.540555556	FGF2	0.34	0.35	0.72	0.93	0.71	0.4	0.59	
0.540555556	NOS2A v1	0.38	0.39	0.6	1.39	1.15	0.43	0.72	
0.538333333	IGFBP2	0.46	0.48	0.65	0.61	0.66	0.93	0.32	
0.537777778	IL1R1	0.32	0.36	1	0.7	0.59	0.59	0.61	
0.536666667	JAK1	0.29	0.9	1.27	0.55	0.45	0.23	0.56	
0.536111111	VGF	0.47	0.44	0.55	0.39	0.59	0.76	0.34	
0.535294118	HOXA1	0.47	0.55	0.82	0.56	0.5	0.54	1.24	
0.534666667	NMBR	1.39	0.72	0.48	0.24	0.23	1.18		
0.533888889	HTR2A	0.57	0.59	0.39	1.23	0.84	0.45	0.46	
0.533888889	PTGER4	0.61	0.64	0.42	0.54	0.46	0.93	0.36	
0.533888889	SIGLEC5	0.38	0.45	0.48	0.46	0.38	0.38	0.44	
0.532142857	TNFSF12 v1	0.64	0.5	0.31	0.49	0.49	0.44		
0.531666667	PGRMC1	0.63	0.54	0.23	0.34	0.48	0.61	0.75	
0.531111111	CD209L	0.65	0.63	0.81	0.38	0.38	0.75	0.83	
0.528888889	PPYR1	0.56	0.41	0.7	0.72	0.9	0.39	0.6	
0.528333333	IL14	0.61	0.57	0.57	0.34	0.38	0.7	0.29	
0.526111111	C5R1	0.52	0.63	0.52	0.74	0.63	0.57	0.66	
0.525555556	ESRRA	0.29	0.36	0.75	1.26	0.6	0.33	0.25	

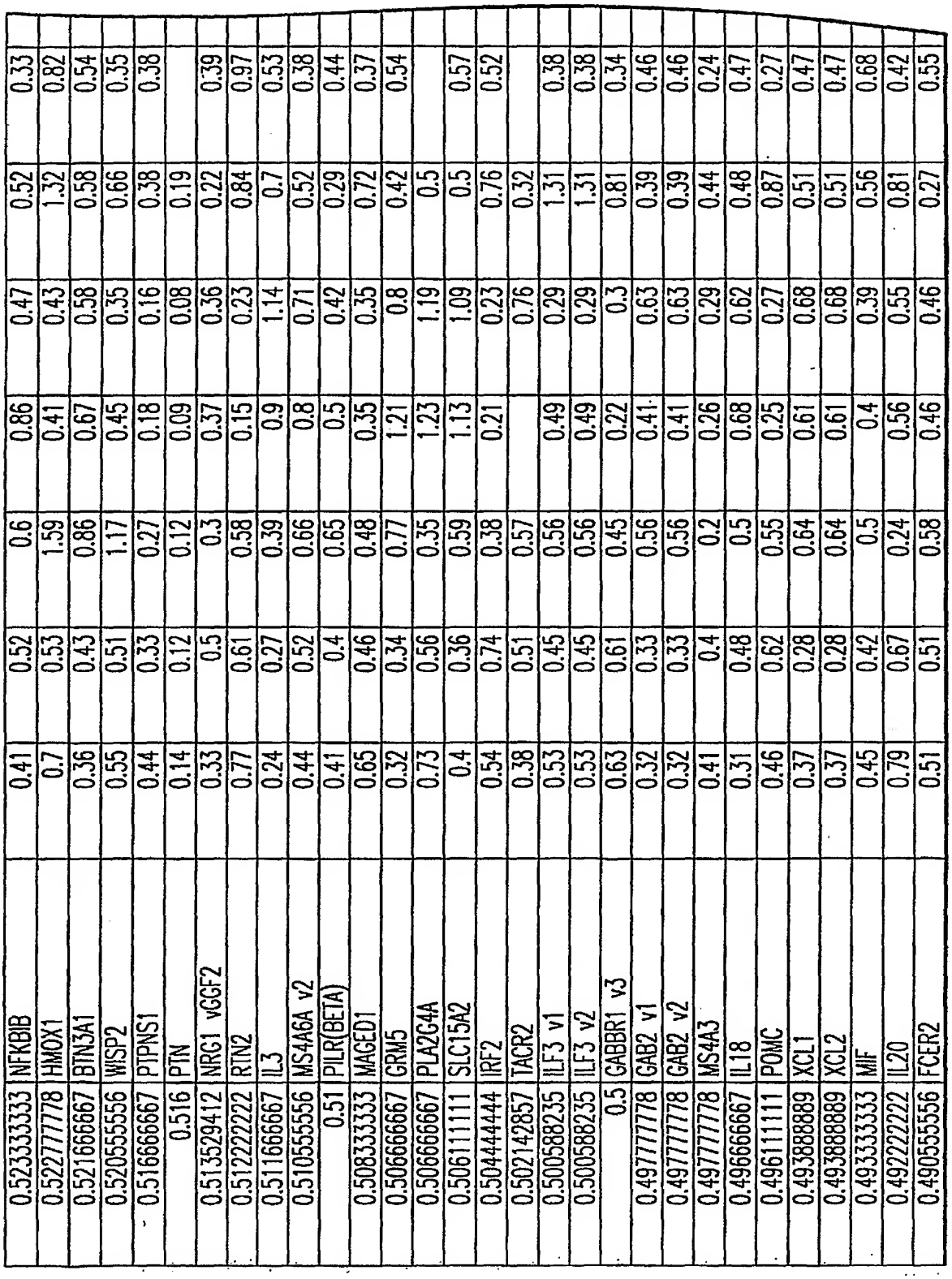
yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes yes

FIG.11-20A



0.13	0.14	0.22	0.23	0.12	0.52	2.11	1.86	1.72	0.58	0.98		
0.64	0.65	0.4	0.47	0.93	0.24	0.35	0.3	0.33	0.27	0.31		
0.14		0.21	0.22	0.1	1.51	1.48		1.45	1.33	1.34		
0.14		0.21	0.22	0.1	1.51	1.48		1.45	1.33	1.34		
0.61	0.53	0.68	0.55	0.56	0.73	0.56	0.61	0.47	0.5	0.52		
0.28	0.71	0.78	0.68	0.21	0.5	0.47	0.63		0.67	0.51		
0.51	0.49	0.62	0.4	0.57	0.82	0.51	0.58	0.41	0.58	0.57		
0.53	0.54	0.5	0.53	0.48	1.11	0.58	0.87	0.49	0.61	0.58		
0.35	0.36	0.66	0.76	0.76	0.51	0.24	0.34	0.44	2.81	0.27		
0.53		0.48	0.55	0.48	0.67	0.58	0.54	0.9	0.7	0.6		
0.47	0.71	0.46	0.85	0.36	0.32	0.2	0.19	0.24	0.27	0.34		
0.27	0.58	0.49	0.54	0.32	0.75	0.45	0.66	0.43	0.67	0.69		
0.96	0.56	0.61	0.58	0.52	0.35	0.48	0.54	0.31		0.22		
0.53	0.37	0.54	0.51	0.62	0.43	0.45	0.48	0.85	0.38	0.53		
0.68	0.33	0.53	0.44	0.87	0.3	0.37	0.35	0.22	0.23	0.35		
0.3	0.37	0.48	0.33	0.45	0.61	0.48	0.82	0.55	0.84	0.35		
0.4	0.34	0.49	0.6	0.52	0.35	0.54	0.49	0.55	0.79	0.44		
0.29	0.3	0.31	0.68	0.72	0.6	0.46	0.74	0.32	0.45	0.54		
0.48	0.45	0.45	0.61	0.37	0.98	0.5	0.52	0.7	0.54	0.51		
1	0.46	0.51	0.48	0.78	0.28	0.26		0.23	0.23	0.19		
	0.94	0.62	0.7		0.97	0.15	0.1	0.08	0.11	0.11		
0.7	0.56	0.73	0.49	0.83	0.22	0.47	0.28	0.22	0.3	0.28		
0.3	0.61	0.82	0.5	0.37	0.61	0.41	0.64	0.41	0.56	0.42		
0.27	0.51	0.44	0.48	0.26	0.7	0.75	0.95	0.8	0.78	0.7		
	0.47	0.42	0.33		0.4		0.83	0.51	0.79	0.83		
0.52	0.42	0.52	0.35	0.43	0.47	0.72	0.86	0.58	0.56	0.56		
0.68	0.47	0.42	0.55	0.59	0.38	0.45	0.37	0.37	0.48	0.37		
0.77	0.42	0.44	0.33	0.69	0.55	0.33	0.53	0.34	0.45	0.39		
0.31	0.89	0.74	0.61	0.4	0.49	0.75	0.12	0.49	0.42	0.83		
0.41	0.51	0.68	0.5	0.52	0.34	0.34	0.29	0.46	0.74	0.41		
0.39	0.36	0.68	0.55	0.45	0.65	0.42	0.62	0.41	0.65	0.44		

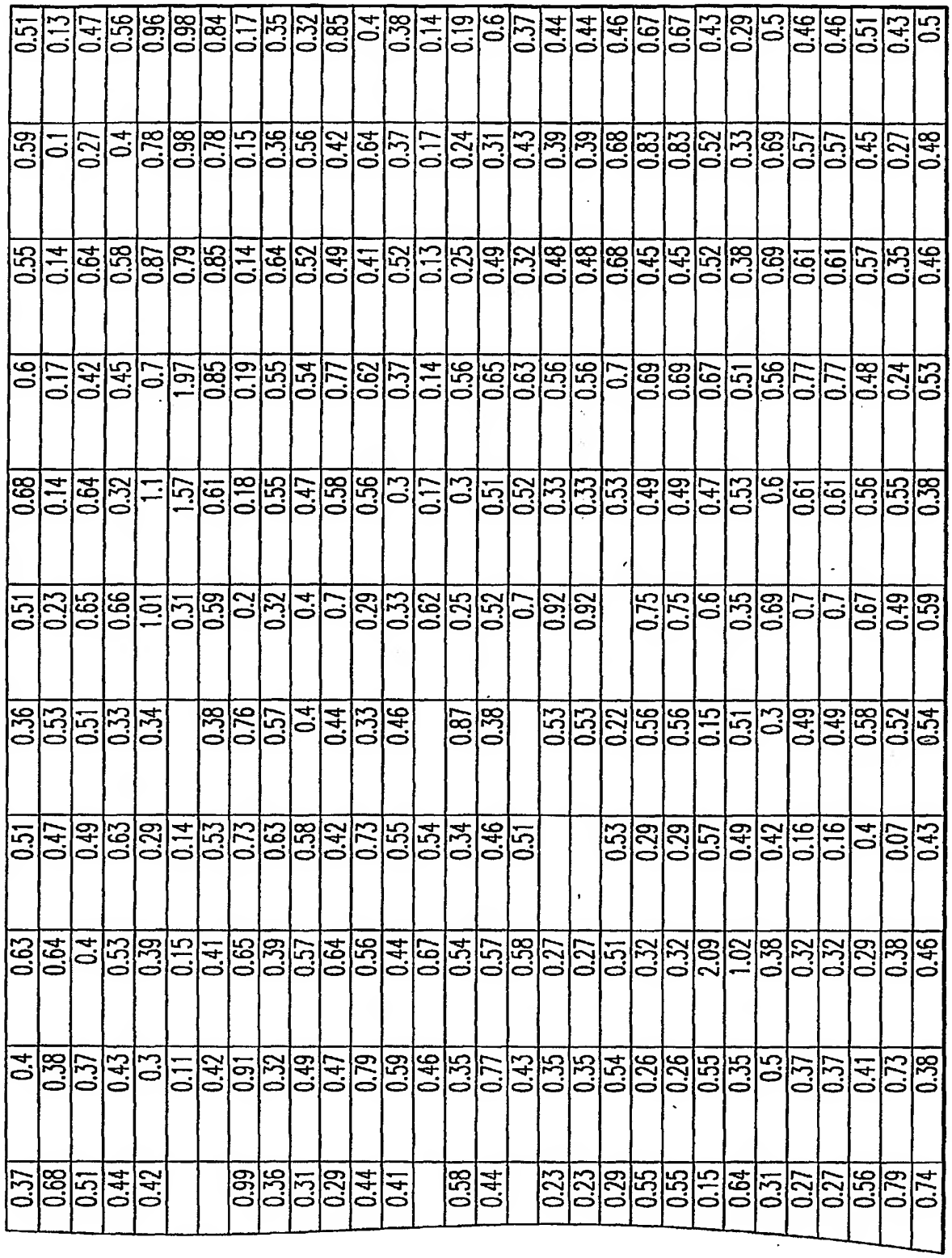
FIG.11-20B



0.523333333	NFKBIB	0.41	0.52	0.6	0.86	0.47	0.52	0.33	
0.522777778	HMOX1	0.7	0.53	1.59	0.41	0.43	1.32	0.82	
0.521666667	BTN3A1	0.36	0.43	0.86	0.67	0.58	0.58	0.54	
0.520555556	WISP2	0.55	0.51	1.17	0.45	0.35	0.66	0.35	
0.516666667	PTPNS1	0.44	0.33	0.27	0.18	0.16	0.38	0.38	
0.516	PTN	0.14	0.12	0.12	0.09	0.08	0.19		
0.513529412	NRG1 vGGF2	0.33	0.5	0.3	0.37	0.36	0.22	0.39	
0.512222222	RTN2	0.77	0.61	0.58	0.15	0.23	0.84	0.97	
0.511666667	IL3	0.24	0.27	0.39	0.9	1.14	0.7	0.53	
0.510555556	MS4A6A v2	0.44	0.52	0.66	0.8	0.71	0.52	0.38	
0.51	PILR(BETA)	0.41	0.4	0.65	0.5	0.42	0.29	0.44	
0.508333333	MAGED1	0.65	0.46	0.48	0.35	0.35	0.72	0.37	
0.506666667	GRM5	0.32	0.34	0.77	1.21	0.8	0.42	0.54	
0.506666667	PLA2G4A	0.73	0.56	0.35	1.23	1.19	0.5		
0.506111111	SLC15A2	0.4	0.36	0.59	1.13	1.09	0.5	0.57	
0.504444444	IRF2	0.54	0.74	0.38	0.21	0.23	0.76	0.52	
0.502142857	TACR2	0.38	0.51	0.57		0.76	0.32		
0.500588235	ILF3 v1	0.53	0.45	0.56	0.49	0.29	1.31	0.38	
0.500588235	ILF3 v2	0.53	0.45	0.56	0.49	0.29	1.31	0.38	
0.5	GABBR1 v3	0.63	0.61	0.45	0.22	0.3	0.81	0.34	
0.497777778	GAB2 v1	0.32	0.33	0.56	0.41	0.63	0.39	0.46	
0.497777778	GAB2 v2	0.32	0.33	0.56	0.41	0.63	0.39	0.46	
0.497777778	MS4A3	0.41	0.4	0.2	0.26	0.29	0.44	0.24	
0.496666667	IL18	0.31	0.48	0.5	0.68	0.62	0.48	0.47	
0.496111111	POMC	0.46	0.62	0.55	0.25	0.27	0.87	0.27	
0.493888889	XCL1	0.37	0.28	0.64	0.61	0.68	0.51	0.47	
0.493888889	XCL2	0.37	0.28	0.64	0.61	0.68	0.51	0.47	
0.493333333	MIF	0.45	0.42	0.5	0.4	0.39	0.56	0.68	
0.492222222	IL20	0.79	0.67	0.24	0.56	0.55	0.81	0.42	
0.490555556	FCER2	0.51	0.51	0.58	0.46	0.46	0.27	0.55	

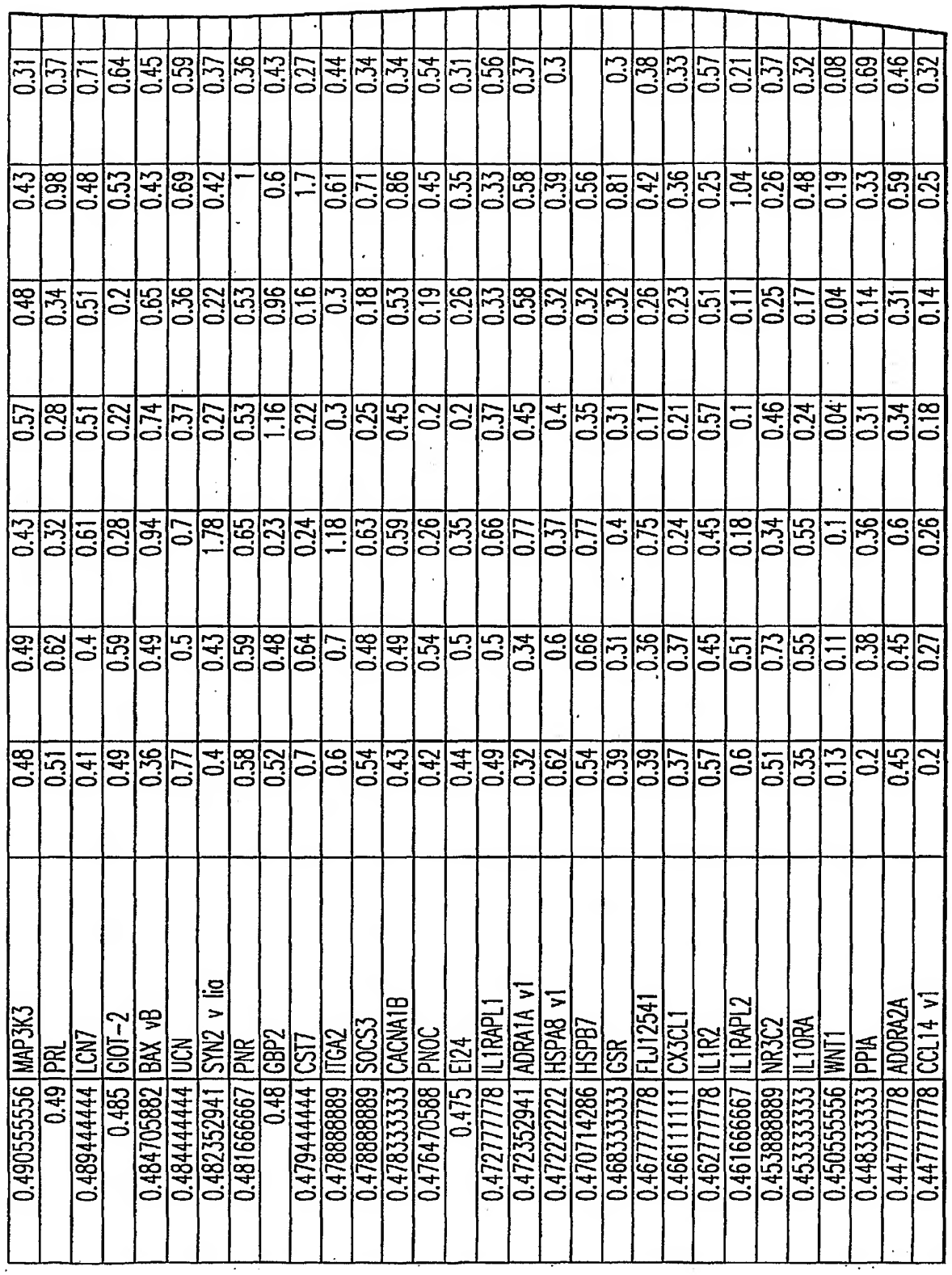
yes yes yes yes yes yes yes yes yes

FIG.11-21A



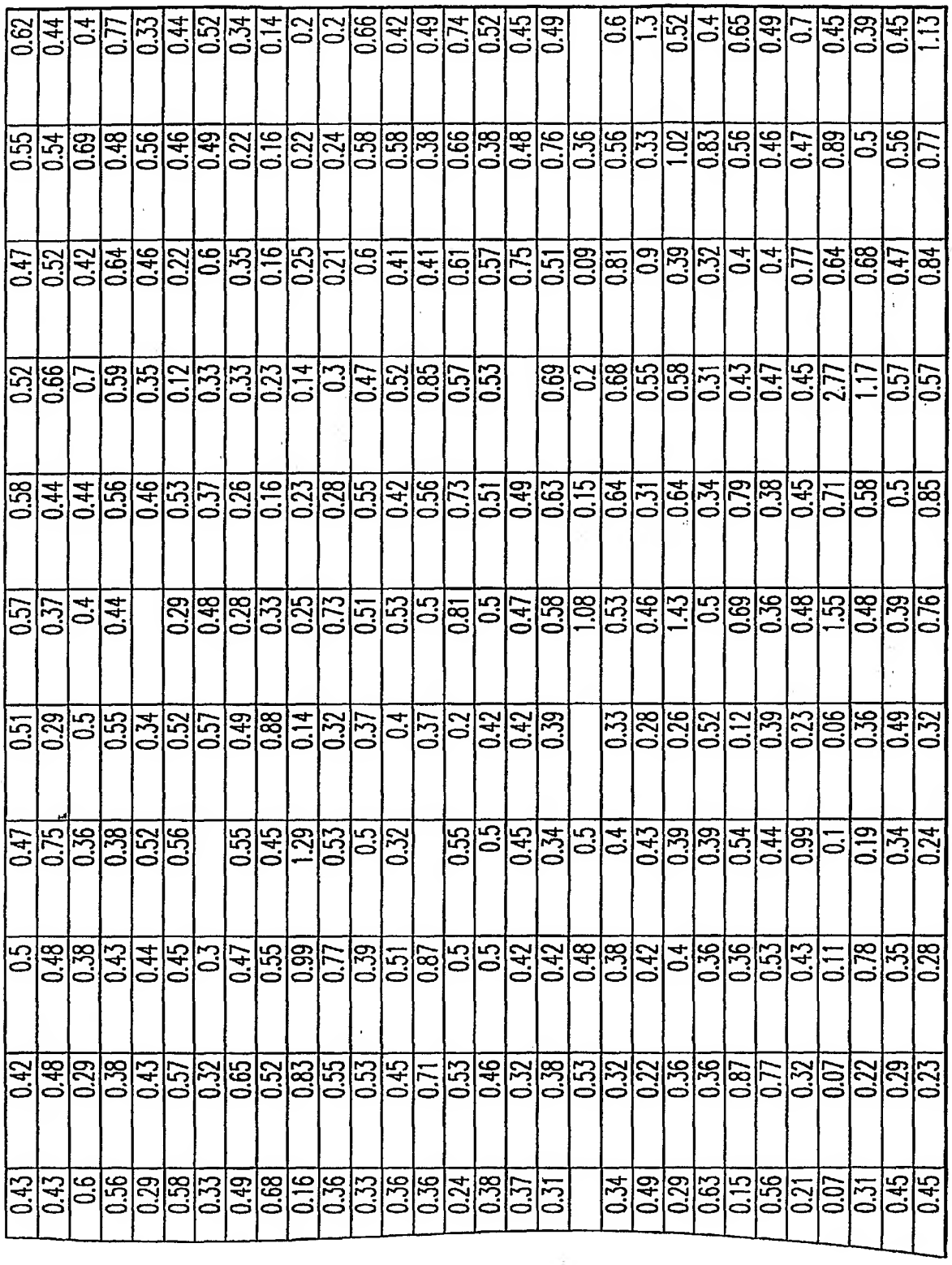
0.37	0.4	0.63	0.51	0.36	0.51	0.68	0.6	0.55	0.59	0.51	
0.68	0.38	0.64	0.47	0.53	0.23	0.14	0.17	0.14	0.1	0.13	
0.51	0.37	0.4	0.49	0.51	0.65	0.64	0.42	0.64	0.27	0.47	
0.44	0.43	0.53	0.63	0.33	0.66	0.32	0.45	0.58	0.4	0.56	
0.42	0.3	0.39	0.29	0.34	1.01	1.1	0.7	0.87	0.78	0.96	
	0.11	0.15	0.14		0.31	1.57	1.97	0.79	0.98	0.98	
	0.42	0.41	0.53	0.38	0.59	0.61	0.85	0.85	0.78	0.84	
0.99	0.91	0.65	0.73	0.76	0.2	0.18	0.19	0.14	0.15	0.17	
0.36	0.32	0.39	0.63	0.57	0.32	0.55	0.55	0.64	0.36	0.35	
0.31	0.49	0.57	0.58	0.4	0.4	0.47	0.54	0.52	0.56	0.32	
0.29	0.47	0.64	0.42	0.44	0.7	0.58	0.77	0.49	0.42	0.85	
0.44	0.79	0.56	0.73	0.33	0.29	0.56	0.62	0.41	0.64	0.4	
0.41	0.59	0.44	0.55	0.46	0.33	0.3	0.37	0.52	0.37	0.38	
	0.46	0.67	0.54		0.62	0.17	0.14	0.13	0.17	0.14	
0.58	0.35	0.54	0.34	0.87	0.25	0.3	0.56	0.25	0.24	0.19	
0.44	0.77	0.57	0.46	0.38	0.52	0.51	0.65	0.49	0.31	0.6	
	0.43	0.58	0.51		0.7	0.52	0.63	0.32	0.43	0.37	
0.23	0.35	0.27		0.53	0.92	0.33	0.56	0.48	0.39	0.44	
0.23	0.35	0.27		0.53	0.92	0.33	0.56	0.48	0.39	0.44	
0.29	0.54	0.51	0.53	0.22		0.53	0.7	0.68	0.68	0.46	
0.55	0.26	0.32	0.29	0.56	0.75	0.49	0.69	0.45	0.83	0.67	
0.55	0.26	0.32	0.29	0.56	0.75	0.49	0.69	0.45	0.83	0.67	
0.15	0.55	2.09	0.57	0.15	0.6	0.47	0.67	0.52	0.52	0.43	
0.64	0.35	1.02	0.49	0.51	0.35	0.53	0.51	0.38	0.33	0.29	
0.31	0.5	0.38	0.42	0.3	0.69	0.6	0.56	0.69	0.69	0.5	
0.27	0.37	0.32	0.16	0.49	0.7	0.61	0.77	0.61	0.57	0.46	
0.27	0.37	0.32	0.16	0.49	0.7	0.61	0.77	0.61	0.57	0.46	
0.56	0.41	0.29	0.4	0.58	0.67	0.56	0.48	0.57	0.45	0.51	
0.79	0.73	0.38	0.07	0.52	0.49	0.55	0.24	0.35	0.27	0.43	
0.74	0.38	0.46	0.43	0.54	0.59	0.38	0.53	0.46	0.48	0.5	

FIG.11-21B



0.490555556	MAP3K3	0.48	0.49	0.43	0.57	0.48	0.43	0.31	
0.49	PRL	0.51	0.62	0.32	0.28	0.34	0.98	0.37	
0.489444444	LCN7	0.41	0.4	0.61	0.51	0.51	0.48	0.71	
0.485	GIOT-2	0.49	0.59	0.28	0.22	0.2	0.53	0.64	
0.484705882	BAX vB	0.36	0.49	0.94	0.74	0.65	0.43	0.45	
0.484444444	UCN	0.77	0.5	0.7	0.37	0.36	0.69	0.59	
0.482352941	SYN2 v lia	0.4	0.43	1.78	0.27	0.22	0.42	0.37	
0.481666667	PNR	0.58	0.59	0.65	0.53	0.53	1	0.36	
0.48	GBP2	0.52	0.48	0.23	1.16	0.96	0.6	0.43	
0.479444444	CST7	0.7	0.64	0.24	0.22	0.16	1.7	0.27	
0.478888889	ITGA2	0.6	0.7	1.18	0.3	0.3	0.61	0.44	
0.478888889	SOCS3	0.54	0.48	0.63	0.25	0.18	0.71	0.34	
0.478333333	CACNA1B	0.43	0.49	0.59	0.45	0.53	0.86	0.34	
0.476470588	PNOC	0.42	0.54	0.26	0.2	0.19	0.45	0.54	
0.475	EI24	0.44	0.5	0.35	0.2	0.26	0.35	0.31	
0.472777778	IL1RAPL1	0.49	0.5	0.66	0.37	0.33	0.33	0.56	
0.472352941	ADRA1A v1	0.32	0.34	0.77	0.45	0.58	0.58	0.37	
0.472222222	HSPA8 v1	0.62	0.6	0.37	0.4	0.32	0.39	0.3	
0.470714286	HSPB7	0.54	0.66	0.77	0.35	0.32	0.56		
0.468333333	GSR	0.39	0.31	0.4	0.31	0.32	0.81	0.3	
0.467777778	FLJ12541	0.39	0.36	0.75	0.17	0.26	0.42	0.38	
0.466111111	CX3CL1	0.37	0.37	0.24	0.21	0.23	0.36	0.33	
0.462777778	IL1R2	0.57	0.45	0.45	0.57	0.51	0.25	0.57	
0.461666667	IL1RAPL2	0.6	0.51	0.18	0.1	0.11	1.04	0.21	
0.453888889	NR3C2	0.51	0.73	0.34	0.46	0.25	0.26	0.37	
0.453333333	IL10RA	0.35	0.55	0.55	0.24	0.17	0.48	0.32	
0.450555556	WNT1	0.13	0.11	0.1	0.04	0.04	0.19	0.08	
0.448333333	PPIA	0.2	0.38	0.36	0.31	0.14	0.33	0.69	
0.447777778	ADORA2A	0.45	0.45	0.6	0.34	0.31	0.59	0.46	
0.447777778	CCL14 v1	0.2	0.27	0.26	0.18	0.14	0.25	0.32	

FIG.11-22A



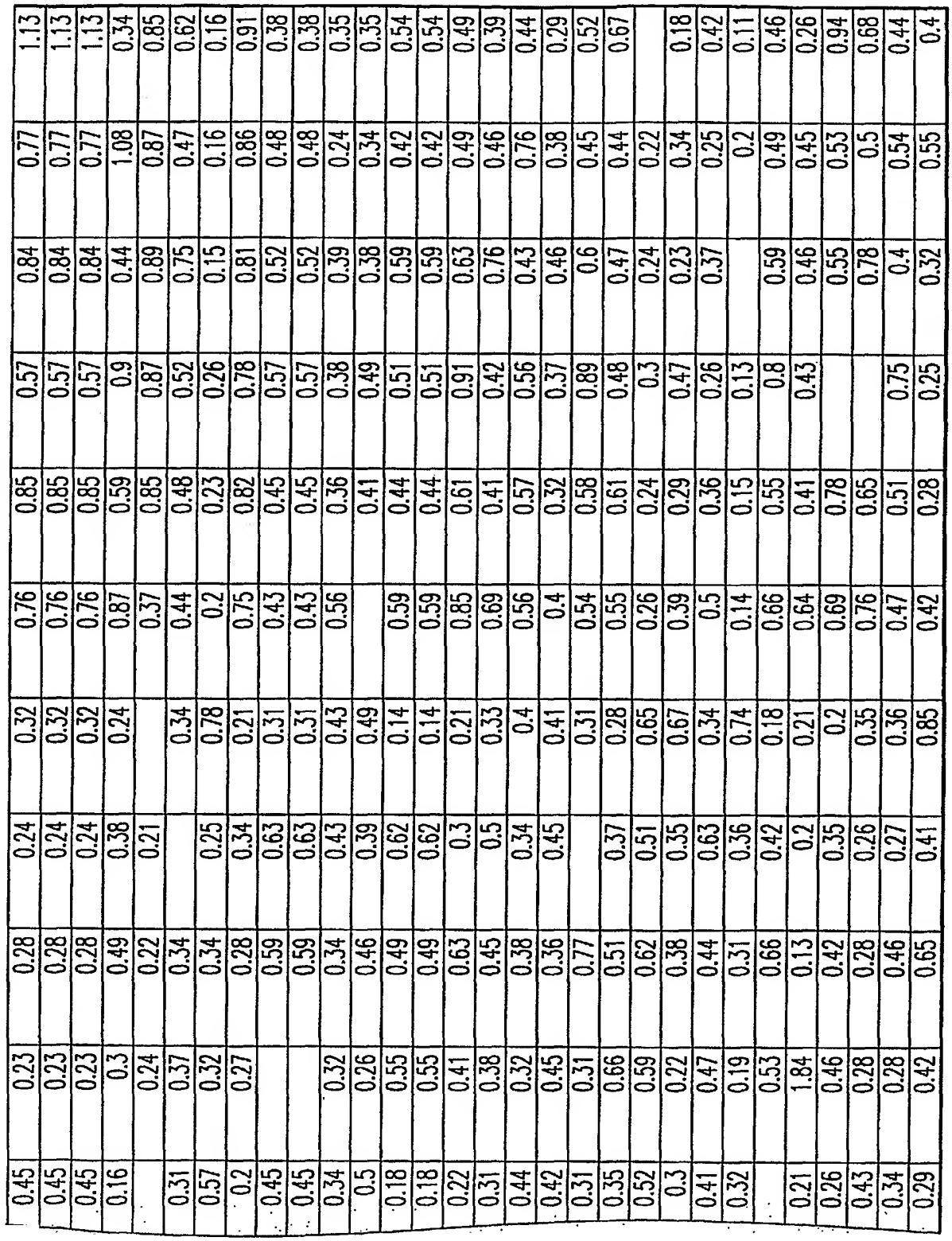
0.43	0.42	0.5	0.47	0.51	0.57	0.58	0.52	0.47	0.55	0.62
0.43	0.48	0.48	0.75	0.29	0.37	0.44	0.66	0.52	0.54	0.44
0.6	0.29	0.38	0.36	0.5	0.4	0.44	0.7	0.42	0.69	0.4
0.56	0.38	0.43	0.38	0.55	0.44	0.56	0.59	0.64	0.48	0.77
0.29	0.43	0.44	0.52	0.34		0.46	0.35	0.46	0.56	0.33
0.58	0.57	0.45	0.56	0.52	0.29	0.53	0.12	0.22	0.46	0.44
0.33	0.32	0.3		0.57	0.48	0.37	0.33	0.6	0.49	0.52
0.49	0.65	0.47	0.55	0.49	0.28	0.26	0.33	0.35	0.22	0.34
0.68	0.52	0.55	0.45	0.88	0.33	0.16	0.23	0.16	0.16	0.14
0.16	0.83	0.99	1.29	0.14	0.25	0.23	0.14	0.25	0.22	0.2
0.36	0.55	0.77	0.53	0.32	0.73	0.28	0.3	0.21	0.24	0.2
0.33	0.53	0.39	0.5	0.37	0.51	0.55	0.47	0.6	0.58	0.66
0.36	0.45	0.51	0.32	0.4	0.53	0.42	0.52	0.41	0.58	0.42
0.36	0.71	0.87		0.37	0.5	0.56	0.85	0.41	0.38	0.49
0.24	0.53	0.5	0.55	0.2	0.81	0.73	0.57	0.61	0.66	0.74
0.38	0.46	0.5	0.5	0.42	0.5	0.51	0.53	0.57	0.38	0.52
0.37	0.32	0.42	0.45	0.42	0.47	0.49		0.75	0.48	0.45
0.31	0.38	0.42	0.34	0.39	0.58	0.63	0.69	0.51	0.76	0.49
	0.53	0.48	0.5		1.08	0.15	0.2	0.09	0.36	
0.34	0.32	0.38	0.4	0.33	0.53	0.64	0.68	0.81	0.56	0.6
0.49	0.22	0.42	0.43	0.28	0.46	0.31	0.55	0.9	0.33	1.3
0.29	0.36	0.4	0.39	0.26	1.43	0.64	0.58	0.39	1.02	0.52
0.63	0.36	0.36	0.39	0.52	0.5	0.34	0.31	0.32	0.83	0.4
0.15	0.87	0.36	0.54	0.12	0.69	0.79	0.43	0.4	0.56	0.65
0.56	0.77	0.53	0.44	0.39	0.36	0.38	0.47	0.4	0.46	0.49
0.21	0.32	0.43	0.99	0.23	0.48	0.45	0.45	0.77	0.47	0.7
0.07	0.07	0.11	0.1	0.06	1.55	0.71	2.77	0.64	0.89	0.45
0.31	0.22	0.78	0.19	0.36	0.48	0.58	1.17	0.68	0.5	0.39
0.45	0.29	0.35	0.34	0.49	0.39	0.5	0.57	0.47	0.56	0.45
0.45	0.23	0.28	0.24	0.32	0.76	0.85	0.57	0.84	0.77	1.13

FIG.11-22B

0.447777778	CCL14 v2	0.2	0.27	0.26	0.18	0.14	0.25	0.32		
0.447777778	CCL15 v1	0.2	0.27	0.26	0.18	0.14	0.25	0.32		
0.447777778	CCL15 v3	0.2	0.27	0.26	0.18	0.14	0.25	0.32		
0.446111111	IL17R	0.41	0.48	0.46	0.19	0.13	0.36	0.21		
0.446	FCER1G	0.23	0.16	0.22	0.17	0.2	0.34			
0.445882353	GPX1	0.35	0.32	0.54	0.45	0.38	0.34	0.56		
0.445555556	IFNW1	0.41	0.36	0.33	1.47	1.11	0.39	0.53		
0.445	CCL25 v1	0.38	0.27	0.21	0.16	0.16	0.41	0.19		
0.444705882	PTGS1 v1	0.33	0.33	0.29	0.39	0.61	0.32	0.48		
0.444705882	PTGS1 v2	0.33	0.33	0.29	0.39	0.61	0.32	0.48		
0.444444444	TRAF1	0.45	0.5	1.08	0.39	0.25	0.79	0.4		
0.444117647	WSX1	0.37	0.39	0.48	0.71	0.7	0.31	0.52		
0.442777778	ACCN3 v1	0.65	0.66	0.37	0.12	0.17	0.78	0.15		
0.442777778	ACCN3 v2	0.65	0.66	0.37	0.12	0.17	0.78	0.15		
0.441666667	GABRE v3	0.19	0.31	0.27	0.55	0.37	0.22	0.29		
0.441111111	RNASE3	0.41	0.23	0.57	0.38	0.45	0.51	0.29		
0.438888889	RNPEPL1	0.07	0.26	0.57	0.52	0.57	0.31	0.4		
0.435555556	FGF3	0.47	0.48	0.77	0.34	0.35	0.76	0.36		
0.434705882	PTGIR	0.29	0.34	0.43	0.18	0.2	0.35	0.32		
0.433333333	IL22	0.5	0.49	0.24	0.32	0.29	0.26	0.31		
0.432941176	DF	0.75	0.56	0.39	0.15	0.2	0.54	0.62		
0.43	GRPR	0.13	0.22	0.33	0.73	1.24	0.57	0.7		
0.427222222	HLALS	0.48	0.53	0.63	0.31	0.3	0.61	0.38		
0.427058824	LRBA	0.08	0.09	0.39	1.11	1.87	0.7	0.37		
0.426470588	SLC29A1	0.26	0.35	0.22	0.24	0.26	0.27	0.31		
0.425	ITGAM	0.27	1.23	0.18	0.07	0.11	0.22	0.33		
0.424117647	VDR	0.63	0.47	0.16	0.08	0.1	0.43	0.16		
0.421764706	CDC37	0.47	0.39	0.28	0.16	0.22	0.33	0.35		
0.42	ALDH7A1	0.28	0.3	0.25	0.47	0.66	0.19	0.59		
0.419444444	HSPB2	0.3	0.34	0.39	0.58	0.44	0.35	0.31		

yes yes yes yes yes yes yes yes yes

FIG.11-23A

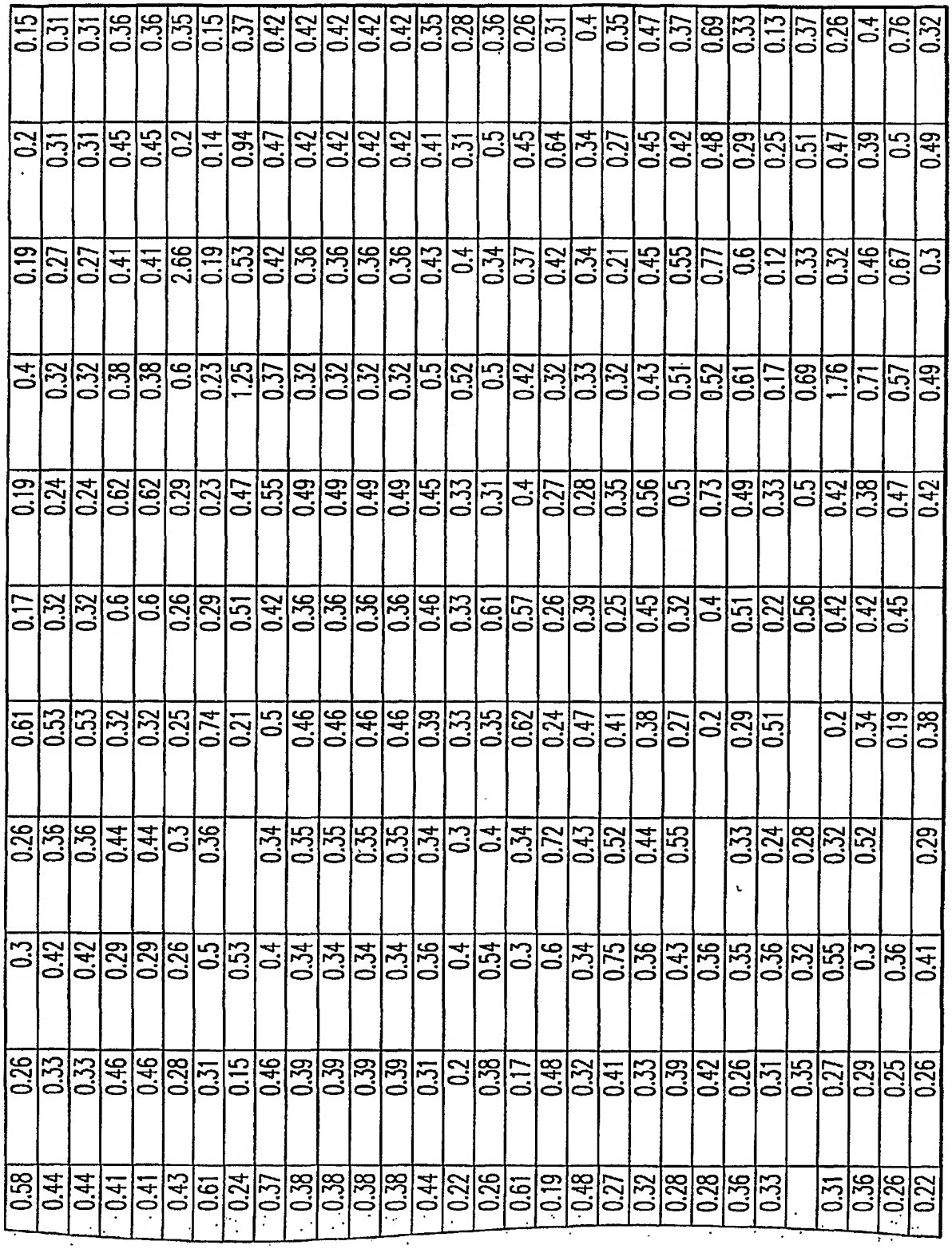


0.45	0.23	0.28	0.24	0.32	0.76	0.85	0.57	0.84	0.77	1.13	
0.45	0.23	0.28	0.24	0.32	0.76	0.85	0.57	0.84	0.77	1.13	
0.45	0.23	0.28	0.24	0.32	0.76	0.85	0.57	0.84	0.77	1.13	
0.16	0.3	0.49	0.38	0.24	0.87	0.59	0.9	0.44	1.08	0.34	
	0.24	0.22	0.21		0.37	0.85	0.87	0.89	0.87	0.85	
0.31	0.37	0.34		0.34	0.44	0.48	0.52	0.75	0.47	0.62	
0.57	0.32	0.34	0.25	0.78	0.2	0.23	0.26	0.15	0.16	0.16	
0.2	0.27	0.28	0.34	0.21	0.75	0.82	0.78	0.81	0.86	0.91	
0.45		0.59	0.63	0.31	0.43	0.45	0.57	0.52	0.48	0.38	
0.45		0.59	0.63	0.31	0.43	0.45	0.57	0.52	0.48	0.38	
0.34	0.32	0.34	0.43	0.43	0.56	0.36	0.38	0.39	0.24	0.35	
0.5	0.26	0.46	0.39	0.49		0.41	0.49	0.38	0.34	0.35	
0.18	0.55	0.49	0.62	0.14	0.59	0.44	0.51	0.59	0.42	0.54	
0.18	0.55	0.49	0.62	0.14	0.59	0.44	0.51	0.59	0.42	0.54	
0.22	0.41	0.63	0.3	0.21	0.85	0.61	0.91	0.63	0.49	0.49	
0.31	0.38	0.45	0.5	0.33	0.69	0.41	0.42	0.76	0.46	0.39	
0.44	0.32	0.38	0.34	0.4	0.56	0.57	0.56	0.43	0.76	0.44	
0.42	0.45	0.36	0.45	0.41	0.4	0.32	0.37	0.46	0.38	0.29	
0.31	0.31	0.77		0.31	0.54	0.58	0.89	0.6	0.45	0.52	
0.35	0.66	0.51	0.37	0.28	0.55	0.61	0.48	0.47	0.44	0.67	
0.52	0.59	0.62	0.51	0.65	0.26	0.24	0.3	0.24	0.22		
0.3	0.22	0.38	0.35	0.67	0.39	0.29	0.47	0.23	0.34	0.18	
0.41	0.47	0.44	0.63	0.34	0.5	0.36	0.26	0.37	0.25	0.42	
0.32	0.19	0.31	0.36	0.74	0.14	0.15	0.13		0.2	0.11	
	0.53	0.66	0.42	0.18	0.66	0.55	0.8	0.59	0.49	0.46	
0.21	1.84	0.13	0.2	0.21	0.64	0.41	0.43	0.46	0.45	0.26	
0.26	0.46	0.42	0.35	0.2	0.69	0.78		0.55	0.53	0.94	
0.43	0.28	0.28	0.26	0.35	0.76	0.65		0.78	0.5	0.68	
0.34	0.28	0.46	0.27	0.36	0.47	0.51	0.75	0.4	0.54	0.44	
0.29	0.42	0.65	0.41	0.85	0.42	0.28	0.25	0.32	0.55	0.4	

FIG.11-23B

0.418333333	ESR1	0.2	0.18	0.86	0.98	1.17	0.19	0.64	
0.417777778	TNFRSF6B v2	0.49	0.41	0.49	0.71	0.56	0.49	0.52	
0.417777778	TNFRSF6B v3	0.49	0.41	0.49	0.71	0.56	0.49	0.52	
0.416666667	RLN1	0.46	0.49	0.21	0.24	0.33	0.61	0.42	
0.416666667	RLN2 v1	0.46	0.49	0.21	0.24	0.33	0.61	0.42	
0.416111111	CXCR4	0.22	0.26	0.21	0.13	0.19	0.26	0.34	
0.414444444	SLC6A2	0.54	0.45	0.6	0.5	0.46	0.56	0.6	
0.412941176	KLRD1 v1	0.13	0.16	0.22	0.39	0.32	0.26	0.34	
0.411666667	UCHL1	0.39	0.36	0.41	0.36	0.31	0.34	0.52	
0.411111111	TAC1 vB	0.39	0.37	0.48	0.52	0.46	0.39	0.5	
0.411111111	TAC1 vA	0.39	0.37	0.48	0.52	0.46	0.39	0.5	
0.411111111	TAC1 vC	0.39	0.37	0.48	0.52	0.46	0.39	0.5	
0.411111111	TAC1 vD	0.39	0.37	0.48	0.52	0.46	0.39	0.5	
0.411111111	FOXA2 v1	0.36	0.41	0.86	0.23	0.28	0.52	0.3	
0.410555556	ANXA13	0.15	0.22	0.6	1.15	1.1	0.23	0.32	
0.41	RARA	0.29	0.41	0.52	0.44	0.46	0.45	0.26	
0.408888889	GDNF	0.19	0.21	0.24	0.71	0.69	0.19	0.62	
0.406666667	MST1	0.38	0.7	0.37	0.28	0.35	0.47	0.32	
0.406111111	INSL5	0.31	0.43	0.71	0.41	0.42	0.47	0.44	
0.405555556	SPAP1	0.28	0.35	0.38	1.08	0.48	0.38	0.24	
0.402222222	CTBP2 v2	0.3	0.36	0.46	0.48	0.39	0.29	0.32	
0.401666667	SLC1A1	0.38	0.35	0.26	0.3	0.34	0.69	0.32	
0.4	ANXA7 v1	0.24	0.3	0.24	0.32	0.35	0.22	0.28	
0.4	SHBG	0.5	0.42	0.29	0.28	0.45	0.44	0.4	
0.399444444	EBI2	0.15	0.1	0.32	0.85	1.88	0.37	0.55	
0.398	THRB	0.35	0.32	0.32	0.32	0.26	0.49		
0.395555556	CHRNB4	0.29	0.29	0.18	0.23	0.23	0.34	0.26	
0.393888889	PDGFB	0.51	0.43	0.2	0.3	0.31	0.43	0.34	
0.393529412	CALCYON	0.26	0.29	0.5	0.34	0.21	0.38	0.23	
0.392352941	NRG1vSMDF	0.17	0.21	0.29	0.75	1.05	0.24	0.38	
yes		yes	yes	yes	yes	yes	yes	yes	

FIG.11-24A



0.58	0.26	0.3	0.26	0.61	0.17	0.19	0.4	0.19	0.2	0.15			
0.44	0.33	0.42	0.36	0.53	0.32	0.24	0.32	0.27	0.31	0.31			
0.44	0.33	0.42	0.36	0.53	0.32	0.24	0.32	0.27	0.31	0.31			
0.41	0.46	0.29	0.44	0.32	0.6	0.62	0.38	0.41	0.45	0.36			
0.41	0.46	0.29	0.44	0.32	0.6	0.62	0.38	0.41	0.45	0.36			
0.43	0.28	0.26	0.3	0.25	0.26	0.29	0.6	2.66	0.2	0.35			
0.61	0.31	0.5	0.36	0.74	0.29	0.23	0.23	0.19	0.14	0.15			
0.24	0.15	0.53		0.21	0.51	0.47	1.25	0.53	0.94	0.37			
0.37	0.46	0.4	0.34	0.5	0.42	0.55	0.37	0.42	0.47	0.42			
0.38	0.39	0.34	0.35	0.46	0.36	0.49	0.32	0.36	0.42	0.42			
0.38	0.39	0.34	0.35	0.46	0.36	0.49	0.32	0.36	0.42	0.42			
0.38	0.39	0.34	0.35	0.46	0.36	0.49	0.32	0.36	0.42	0.42			
0.38	0.39	0.34	0.35	0.46	0.36	0.49	0.32	0.36	0.42	0.42			
0.44	0.31	0.36	0.34	0.39	0.46	0.45	0.5	0.43	0.41	0.35			
0.22	0.2	0.4	0.3	0.33	0.33	0.33	0.52	0.4	0.31	0.28			
0.26	0.38	0.54	0.4	0.35	0.61	0.31	0.5	0.34	0.5	0.36			
0.61	0.17	0.3	0.34	0.62	0.57	0.4	0.42	0.37	0.45	0.26			
0.19	0.48	0.6	0.72	0.24	0.26	0.27	0.32	0.42	0.64	0.31			
0.48	0.32	0.34	0.43	0.47	0.39	0.28	0.33	0.34	0.34	0.4			
0.27	0.41	0.75	0.52	0.41	0.25	0.35	0.32	0.21	0.27	0.35			
0.32	0.33	0.36	0.44	0.38	0.45	0.56	0.43	0.45	0.45	0.47			
0.28	0.39	0.43	0.55	0.27	0.32	0.5	0.51	0.55	0.42	0.37			
0.28	0.42	0.36		0.2	0.4	0.73	0.52	0.77	0.48	0.69			
0.36	0.26	0.35	0.33	0.29	0.51	0.49	0.61	0.6	0.29	0.33			
0.33	0.31	0.36	0.24	0.51	0.22	0.33	0.17	0.12	0.25	0.13			
	0.35	0.32	0.28		0.56	0.5	0.69	0.33	0.51	0.37			
0.31	0.27	0.55	0.32	0.2	0.42	0.42	1.76	0.32	0.47	0.26			
0.36	0.29	0.3	0.52	0.34	0.42	0.38	0.71	0.46	0.39	0.4			
0.26	0.25	0.36		0.19	0.45	0.47	0.57	0.67	0.5	0.76			
0.22	0.26	0.41	0.29	0.38		0.42	0.49	0.3	0.49	0.32			

FIG. 11-24B

0.391666667	ICAM5	0.38	0.3	0.41	0.29	0.47	0.42	0.31
0.391111111	CASP7 va	0.19	0.29	0.5	0.34	0.3	0.32	0.29
0.391111111	CASP7 vc	0.19	0.29	0.5	0.34	0.3	0.32	0.29
0.391111111	CASP7 vD	0.19	0.29	0.5	0.34	0.3	0.32	0.29
0.385333333	NPPA	0.38	0.42	0.45	0.73	0.49	0.44	
0.383888889	C4BPA	0.16	0.15	0.38	1.24	1.06	0.29	0.25
0.383888889	TFE3	0.32	0.28	0.27	0.25	0.38	0.5	0.31
0.383888889	GMFG	0.35	0.41	0.48	0.18	0.21	0.49	0.43
0.383529412	C4A	0.36	0.32	0.46	0.17	0.29	0.41	0.31
0.383529412	C4B	0.36	0.32	0.46	0.17	0.29	0.41	0.31
0.382857143	TNFSF11 v1	0.25	0.26	0.22	0.47	0.38	0.27	
0.382857143	TNFSF11 v2	0.25	0.26	0.22	0.47	0.38	0.27	
0.382222222	C4BPB	0.42	0.36	0.21	0.41	0.37	0.57	0.29
0.381666667	NFKB1	0.45	0.41	0.37	0.52	0.3	0.4	0.44
0.381176471	ITGA6	0.45	0.43	0.62	0.32	0.3	0.7	0.29
0.380588235	RPS5	0.42	0.38	0.41	0.16	0.23	0.46	0.31
0.379444444	CCL23 v1	0.49	0.38	0.34	0.3	0.37	0.51	0.32
0.378888889	EDN2	0.4	0.49	0.67	0.31	0.38	0.54	0.46
0.378333333	CXCL12	0.32	0.37	0.48	0.36	0.32	0.35	0.41
0.377777778	IL5	0.4	0.35	0.22	0.76	0.64	0.39	0.43
0.377222222	CYP24	0.34	0.35	0.2	0.22	0.39	0.26	0.4
0.377222222	GRM8	0.28	0.32	0.16	0.09	0.09	0.77	0.13
0.376666667	CHGB	0.21	0.19	0.33	0.99	1.29	0.64	0.35
0.374285714	ADC-90	0.42	0.25	0.44	0.37	0.37	0.29	
0.371176471	MMP9	0.38	0.43	0.38	0.29	0.36	0.32	0.49
0.370588235	FOXA1	0.35	0.44	0.4	0.1	0.18		0.36
0.370588235	RAMP2	0.33	0.27	0.28	0.58	0.27	0.3	0.24
0.37	RLN2 v2	0.29	0.34	0.34	0.32	0.31	0.18	0.28
0.368333333	GPR10	0.16	0.36	0.5	0.19	0.22	0.48	0.45
0.365555556	CCR3	0.38	0.41	0.32	0.46	0.38	0.39	0.43

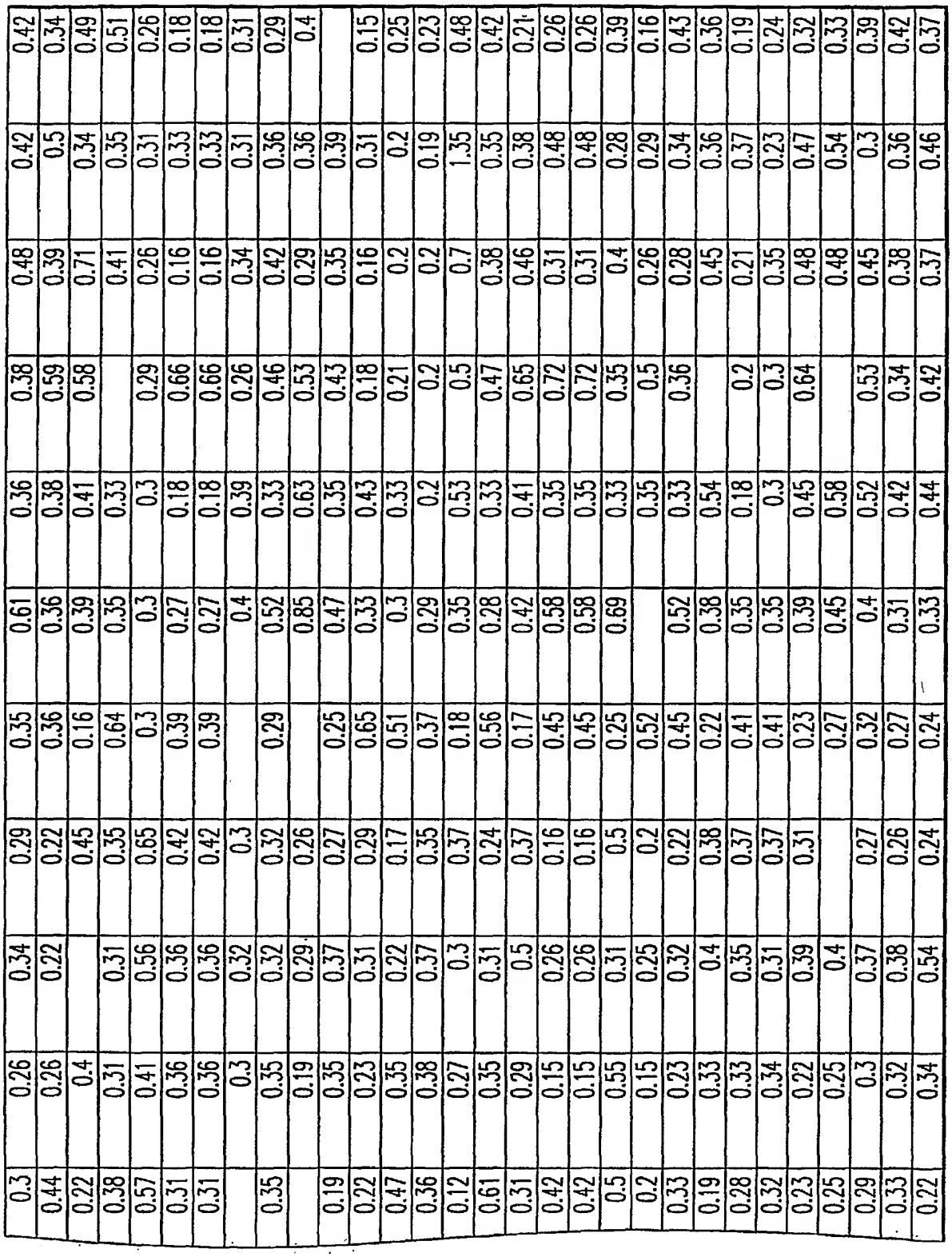
FIG.11-25A

0.35	0.18	0.38	0.27	0.24	0.62	0.5	0.43	0.56	0.35	0.59	
0.22	0.29	0.44	0.36	0.22	0.48	0.54	0.55	0.36	0.71	0.64	
0.22	0.29	0.44	0.36	0.22	0.48	0.54	0.55	0.36	0.71	0.64	
0.22	0.29	0.44	0.36	0.22	0.48	0.54	0.55	0.36	0.71	0.64	
	0.59	0.35	0.4		0.56	0.24	0.2	0.13	0.23	0.17	
0.24	0.1	0.25	0.17	0.4	0.35	0.28	0.34	0.43	0.29	0.53	
0.27	0.32	0.25	0.37	0.28	0.32	0.23	1.64	0.24	0.49	0.19	
0.41	0.44	0.52	0.48	0.34	0.39	0.35	0.43	0.23	0.48	0.29	
0.32	0.34	0.34	0.3	0.33	0.46	0.39	0.84	0.48	0.4		
0.32	0.34	0.34	0.3	0.33	0.46	0.39	0.84	0.48	0.4		
	0.28	0.24	0.22		0.94	0.5	0.51	0.33		0.49	
	0.28	0.24	0.22		0.94	0.5	0.51	0.33		0.49	
0.36	0.38	0.47	0.26	0.39	0.39	0.39	0.51	0.38	0.41	0.31	
0.33	0.49	0.48	0.55	0.26	0.45	0.28	0.37	0.31	0.25	0.21	
0.26	0.39	0.28	0.42	0.33		0.27	0.3	0.43	0.34	0.35	
0.34	0.27	0.25	0.27	0.24		0.54	0.63	0.56	0.53	0.47	
0.37	0.33	0.39	0.27	0.25	0.36	0.36	0.5	0.49	0.38	0.42	
0.39	0.27	0.26	0.3	0.36	0.43	0.28	0.32	0.36	0.29	0.31	
0.45	0.3	0.32	0.3	0.35	0.75	0.34	0.38	0.37	0.29	0.35	
0.47	0.27	0.35	0.28	0.62	0.27	0.3	0.24	0.23	0.33	0.25	
0.22	0.38	0.62	0.37	0.18	0.45	0.55	0.61	0.46	0.56	0.23	
0.12	0.32	0.24	1.92	0.1	0.41	0.42	0.55	0.3	0.35	0.22	
0.26	0.21	0.29	0.17	0.64	0.24	0.21	0.21	0.15	0.24	0.16	
	0.48	0.43	0.5		0.37		0.37	0.32	0.29	0.34	
0.47	0.29	0.26	0.28	0.43	0.5	0.37		0.34	0.36	0.36	
0.49	0.13	0.4	0.31	0.45	0.74	0.41	0.44	0.45	0.29	0.36	
	0.21	0.24	0.22	0.43	0.48	0.52	0.53	0.44	0.49	0.47	
0.3	0.29	0.43	0.4	0.37	0.52	0.35	0.47		0.53	0.57	
0.21	0.3	0.73	0.29	0.31	0.34	0.47	0.57	0.39	0.31	0.35	
0.34	0.38	0.43	0.39	0.33	0.27	0.31	0.3	0.41	0.35	0.3	

FIG.11-25B

0.365	HTR7 vD	0.3	0.32	0.4	0.44	0.3	0.23	0.37
0.365	SRC	0.28	0.25	0.27	0.41	0.4	0.33	0.57
0.362352941	CD1B	0.3	0.31	0.26	0.31	0.32	0.31	0.2
0.361764706	TIMP1	0.27	0.31	0.5	0.22	0.21	0.27	0.43
0.359444444	SCN3A	0.45	0.36	0.41	0.16	0.22	0.4	0.26
0.358333333	PTPN6 v2	0.36	0.39	0.52	0.32	0.35	0.4	0.49
0.358333333	PTPN6 v3	0.36	0.39	0.52	0.32	0.35	0.4	0.49
0.357333333	PGR	0.28	0.42	0.35	0.48	0.57	0.33	
0.355555556	CD28	0.26	0.3	0.43	0.38	0.38	0.22	0.42
0.354666667	HLA-DRB4	0.21	0.34	0.2	0.14	0.12	0.51	
0.353529412	MDK	0.32	0.4	0.41	0.25	0.29	0.65	0.27
0.353333333	IL26	0.15	0.15	0.16	0.56	1.14	0.54	0.4
0.350555556	ADCYAP1	0.3	0.28	0.4	0.78	0.55	0.37	0.42
0.350555556	DUSP8	0.41	0.36	0.65	0.45	0.46	0.5	0.34
0.350555556	GAB1	0.16	0.17	0.17	0.08	0.1	0.33	0.15
0.349444444	RFX2 v2	0.18	0.31	0.31	0.28	0.27	0.38	0.26
0.348333333	IFNGR2	0.28	0.34	0.18	0.23	0.17	0.69	0.21
0.348333333	TRAF3 v1	0.22	0.26	0.44	0.21	0.25	0.3	0.45
0.348333333	TRAF3 v2	0.22	0.26	0.44	0.21	0.25	0.3	0.45
0.347222222	AVP	0.31	0.37	0.16	0.06	0.12	0.36	0.32
0.344705882	CYP4A11	0.1	0.09	0.32	0.62	1	0.43	0.42
0.343888889	CCL11	0.33	0.4	0.23	0.44	0.35	0.32	0.31
0.341764706	PAPPA	0.42	0.41	0.41	0.19	0.19	0.41	0.17
0.341666667	OAT	0.27	0.26	0.23	0.45	0.83	0.36	0.51
0.341111111	RORB	0.29	0.3	0.57	0.32	0.31	0.49	0.34
0.339411765	KLK2		0.17	0.26	0.36	0.31	0.2	0.34
0.33875	SOD2	0.23	0.29	0.16	0.29	0.25	0.27	0.38
0.336666667	MAZ	0.27	0.31	0.19	0.29	0.27	0.18	0.41
0.336111111	VIPR2	0.31	0.37	0.33	0.3	0.25	0.24	0.46
0.335	STAT3 v1	0.21	0.29	0.26	0.33	0.47	0.29	0.21

FIG.11-26A



0.3	0.26	0.34	0.29	0.35	0.61	0.36	0.38	0.48	0.42	0.42		
0.44	0.26	0.22	0.22	0.36	0.36	0.38	0.59	0.39	0.5	0.34		
0.22	0.4		0.45	0.16	0.39	0.41	0.58	0.71	0.34	0.49		
0.38	0.31	0.31	0.35	0.64	0.35	0.33		0.41	0.35	0.51		
0.57	0.41	0.56	0.65	0.3	0.3	0.3	0.29	0.26	0.31	0.26		
0.31	0.36	0.36	0.42	0.39	0.27	0.18	0.66	0.16	0.33	0.18		
0.31	0.36	0.36	0.42	0.39	0.27	0.18	0.66	0.16	0.33	0.18		
	0.3	0.32	0.3		0.4	0.39	0.26	0.34	0.31	0.31		
0.35	0.35	0.32	0.32	0.29	0.52	0.33	0.46	0.42	0.36	0.29		
	0.19	0.29	0.26		0.85	0.63	0.53	0.29	0.36	0.4		
0.19	0.35	0.37	0.27	0.25	0.47	0.35	0.43	0.35	0.39			
0.22	0.23	0.31	0.29	0.65	0.33	0.43	0.18	0.16	0.31	0.15		
0.47	0.35	0.22	0.17	0.51	0.3	0.33	0.21	0.2	0.2	0.25		
0.36	0.38	0.37	0.35	0.37	0.29	0.2	0.2	0.2	0.19	0.23		
0.12	0.27	0.3	0.37	0.18	0.35	0.53	0.5	0.7	1.35	0.48		
0.61	0.35	0.31	0.24	0.56	0.28	0.33	0.47	0.38	0.35	0.42		
0.31	0.29	0.5	0.37	0.17	0.42	0.41	0.65	0.46	0.38	0.21		
0.42	0.15	0.26	0.16	0.45	0.58	0.35	0.72	0.31	0.48	0.26		
0.42	0.15	0.26	0.16	0.45	0.58	0.35	0.72	0.31	0.48	0.26		
0.5	0.55	0.31	0.5	0.25	0.69	0.33	0.35	0.4	0.28	0.39		
0.2	0.15	0.25	0.2	0.52		0.35	0.5	0.26	0.29	0.16		
0.33	0.23	0.32	0.22	0.45	0.52	0.33	0.36	0.28	0.34	0.43		
0.19	0.33	0.4	0.38	0.22	0.38	0.54		0.45	0.36	0.36		
0.28	0.33	0.35	0.37	0.41	0.35	0.18	0.2	0.21	0.37	0.19		
0.32	0.34	0.31	0.37	0.41	0.35	0.3	0.3	0.35	0.23	0.24		
0.23	0.22	0.39	0.31	0.23	0.39	0.45	0.64	0.48	0.47	0.32		
0.25	0.25	0.4		0.27	0.45	0.58		0.48	0.54	0.33		
0.29	0.3	0.37	0.27	0.32	0.4	0.52	0.53	0.45	0.3	0.39		
0.33	0.32	0.38	0.26	0.27	0.31	0.42	0.34	0.38	0.36	0.42		
0.22	0.34	0.54	0.24	0.24	0.33	0.44	0.42	0.37	0.46	0.37		

FIG.11-26B

0.335	STAT3 v2	0.21	0.29	0.26	0.33	0.47	0.29	0.21
0.333888889	PTPN7 v1	0.25	0.26	0.23	0.38	0.32	0.27	0.4
0.333888889	PTPN7 v2	0.25	0.26	0.23	0.38	0.32	0.27	0.4
0.333888889	PTPN7 v3	0.25	0.26	0.23	0.38	0.32	0.27	0.4
0.333529412	G1P2	0.4	0.37	0.37	0.25	0.21	0.49	0.32
0.332222222	CDK4 v1	0.36	0.4	0.29	0.32	0.25	0.47	0.15
0.332222222	CDK4 v2	0.36	0.4	0.29	0.32	0.25	0.47	0.15
0.330555556	DPP4	0.47	0.57	0.27	0.11	0.13	0.74	0.17
0.330555556	NFATC1	0.34	0.33	0.55	0.37	0.24	0.47	0.26
0.328333333	LEP	0.42	0.37	0.54	0.48	0.72	0.41	0.42
0.327777778	SPP1	0.35	0.36	0.22	0.21	0.18	0.32	0.25
0.327647059	IL6R	0.72	0.48	0.28		0.09	0.99	0.16
0.327222222	NPPC	0.38	0.36	0.3	0.17	0.17	0.36	0.28
0.327222222	CYSLTR2	0.18	0.17	0.38	0.96	0.61	0.2	0.5
0.325882353	GRID2	0.33	0.39	0.56	0.15	0.16	0.27	0.24
0.323888889	CXCR6	0.29	0.35	0.38	0.17	0.28	0.22	0.25
0.321111111	FKBP3	0.29	0.3	0.47	0.48	0.42	0.32	0.28
0.320555556	PRDM1	0.28	0.49	0.23	0.21	0.21	0.64	0.26
0.319411765	C3	0.21	0.2	0.16	0.21	0.55	0.42	0.28
0.318333333	PIP	0.28	0.32	0.37	0.2	0.2	0.35	0.3
0.317222222	SCN2A2	0.31	0.34	0.25	0.27	0.3	0.56	0.28
0.317222222	PTGIS	0.21	0.37	0.21	0.07	0.09	0.36	0.23
0.313333333	PRH	0.26	0.31	0.66	0.21	0.2	0.17	0.19
0.31	IFRD2	0.29	0.32	0.32	0.17	0.17	0.3	0.21
0.309444444	SERPINE1	0.31	0.31	0.49	0.5	0.35	0.47	0.32
0.309444444	CCL16	0.23	0.32	0.29	0.28	0.28	0.59	0.25
0.307058824	CCKAR	0.35	0.37	0.44	0.26	0.21	0.37	0.28
0.305555556	MAFF	0.35	0.35	0.38	0.15	0.11	0.45	0.19
0.305	TRHR	0.32	0.22	0.27	0.32	0.26	0.33	0.3
0.302222222	TNFSF13B	0.23	0.17	0.18	0.38	0.53	0.23	0.25
0.299444444	SELPLG	0.27	0.25	0.23	0.48	0.34	0.22	0.17

FIG.11-27A

0.22	0.34	0.54	0.24	0.24	0.33	0.44	0.42	0.37	0.46	0.37			
0.53	0.26	0.36	0.49	0.35	0.38	0.32	0.31	0.3	0.36	0.24			
0.53	0.26	0.36	0.49	0.35	0.38	0.32	0.31	0.3	0.36	0.24			
0.53	0.26	0.36	0.49	0.35	0.38	0.32	0.31	0.3	0.36	0.24			
0.44	0.29	0.31	0.36	0.34	0.29		0.44	0.3	0.26	0.23			
0.13	0.42	0.52	0.46	0.15	0.33	0.34	0.38	0.3	0.35	0.36			
0.13	0.42	0.52	0.46	0.15	0.33	0.34	0.38	0.3	0.35	0.36			
0.65	0.59	0.31	0.46	0.14	0.45	0.22	0.18	0.14	0.22	0.13			
0.32	0.32	0.26	0.33	0.27	0.37	0.3	0.31	0.34	0.26	0.31			
0.31	0.27	0.35	0.29	0.52	0.17	0.13	0.18	0.1	0.15	0.08			
0.28	0.38	0.2	0.23	0.95	0.29	0.31	0.53	0.22	0.35	0.27			
0.11	0.68	0.33	0.73	0.07	0.2	0.16	0.12	0.11	0.19	0.15			
0.33	0.39	0.37	0.25	0.27	0.59	0.36	0.32	0.31	0.32	0.36			
0.45	0.18	0.25	0.18	0.52	0.24	0.19	0.22	0.27	0.17	0.22			
0.28	0.32	0.32		0.21	0.46	0.37	0.33	0.35	0.4	0.4			
0.17	0.4	0.41	0.46	0.19	0.36	0.44	0.43	0.33	0.38	0.32			
0.31	0.25	0.25	0.24	0.33	0.69	0.21	0.23	0.22	0.26	0.23			
0.21	0.35	0.47	0.46	0.31	0.22	0.29	0.3	0.22	0.34	0.28			
0.21	0.27	0.45		0.31	0.4	0.37	0.52	0.26	0.4	0.21			
0.26	0.19	0.23	0.23	0.21	0.36	0.46	0.48	0.48	0.32	0.49			
0.23	0.3	0.29	0.35	0.24	0.85	0.15	0.41	0.21	0.19	0.18			
0.48	0.27	0.23	0.21	0.22	0.69	0.39	0.5	0.39	0.24	0.55			
0.22	0.25	0.35	0.24	0.21	0.4	0.48	0.42	0.3	0.33	0.44			
0.21	0.2	0.25	0.27	0.22	0.56	0.3	0.56	0.54	0.27	0.42			
0.29	0.33	0.4	0.34	0.38	0.21	0.15	0.2	0.2	0.17	0.15			
0.21	0.32	0.28	0.23	0.28	0.34	0.35	0.38	0.28	0.46	0.2			
0.26	0.27	0.34	0.39	0.21	0.45	0.26	0.36	0.19		0.21			
0.19	0.3	0.35	0.32	0.24	0.35	0.49	0.3	0.36	0.4	0.22			
0.31	0.25	0.23	0.25	0.27	0.33	0.38	0.31	0.42	0.39	0.33			
0.33	0.14	0.29	0.15	0.25	0.47	0.42	0.36	0.37	0.37	0.32			
0.16	0.32	0.43	0.32	0.2	0.38	0.29	0.34	0.33	0.32	0.34			

FIG.11-27B

0.297058824	FIGF	0.2	0.19	0.26	0.38	0.39	0.28	0.26	
0.296111111	PDGFRL	0.28	0.32	0.23	0.51	0.58	0.35	0.25	
0.295294118	C9		0.21	0.72	0.31	0.3	0.31	0.39	
0.293333333	ANXA11 vA	0.14	0.13	0.22	0.15	0.14	0.18	0.16	
0.292777778	C1QR1	0.33	0.26	0.24	0.15	0.14	0.41	0.2	
0.292777778	HTR6	0.22	0.18	0.68	0.37	0.35	0.28	0.3	
0.292222222	GABRB1	0.23	0.27	0.21	0.2	0.16	0.24	0.2	
0.291176471	GABRP	0.12	0.15	0.21		0.09	0.27	0.15	
0.291111111	PTGER3	0.27	0.24	0.14	0.45	0.27	0.33	0.24	
0.290555556	SLPI	0.33	0.41	0.24	0.24	0.25	0.41	0.5	
0.288333333	SLC11A1	0.41	0.51	0.28	0.12	0.13	0.79	0.26	
0.288333333	ZFP36	0.15	0.18	0.44	0.12	0.15	0.3	0.26	
0.287777778	LTC4S v1	0.22	0.31	0.5	0.2	0.16	0.31	0.34	
0.287777778	LTC4S v2	0.22	0.31	0.5	0.2	0.16	0.31	0.34	
0.287777778	IL17E	0.16	0.21	0.23	0.56	0.32	0.19	0.33	
0.287222222	SLC6A1	0.23	0.21	0.46	0.12	0.1	0.32	0.16	
0.286111111	PTGS2	0.14	0.15	0.26	0.74	0.56	0.19	0.19	
0.286	SCYE1	0.27	0.31	0.16	0.35	0.42	0.23		
0.285555556	CTLA4	0.49	0.38	0.32	0.38	0.59	0.42	0.19	
0.285	CCL19	0.23	0.29	0.42	0.39	0.31	0.24	0.25	
0.285	PRKCD	0.23	0.26	0.29	0.23	0.17	0.24	0.17	
0.283333333	GGTLA1	0.15	0.15	0.47	0.4	0.41	0.31	0.46	
0.283333333	TRIM	0.28	0.25	0.39	0.32	0.18	0.26		
0.282777778	CETP	0.39	0.36	0.3	0.17	0.12	0.47	0.24	
0.282666667	CD19	0.25	0.29	0.22	0.16	0.16	0.35		
0.279444444	GPR30	0.2	0.19	0.23	0.43	0.94	0.28	0.15	
0.279444444	CASP5	0.27	0.26	0.46	0.27	0.34	0.36	0.3	
0.279444444	SLC18A3	0.09	0.18	0.16	0.06	0.06	0.18	0.17	
0.277777778	RAMP3	0.13	0.2	0.24	0.55	0.34	0.22	0.24	

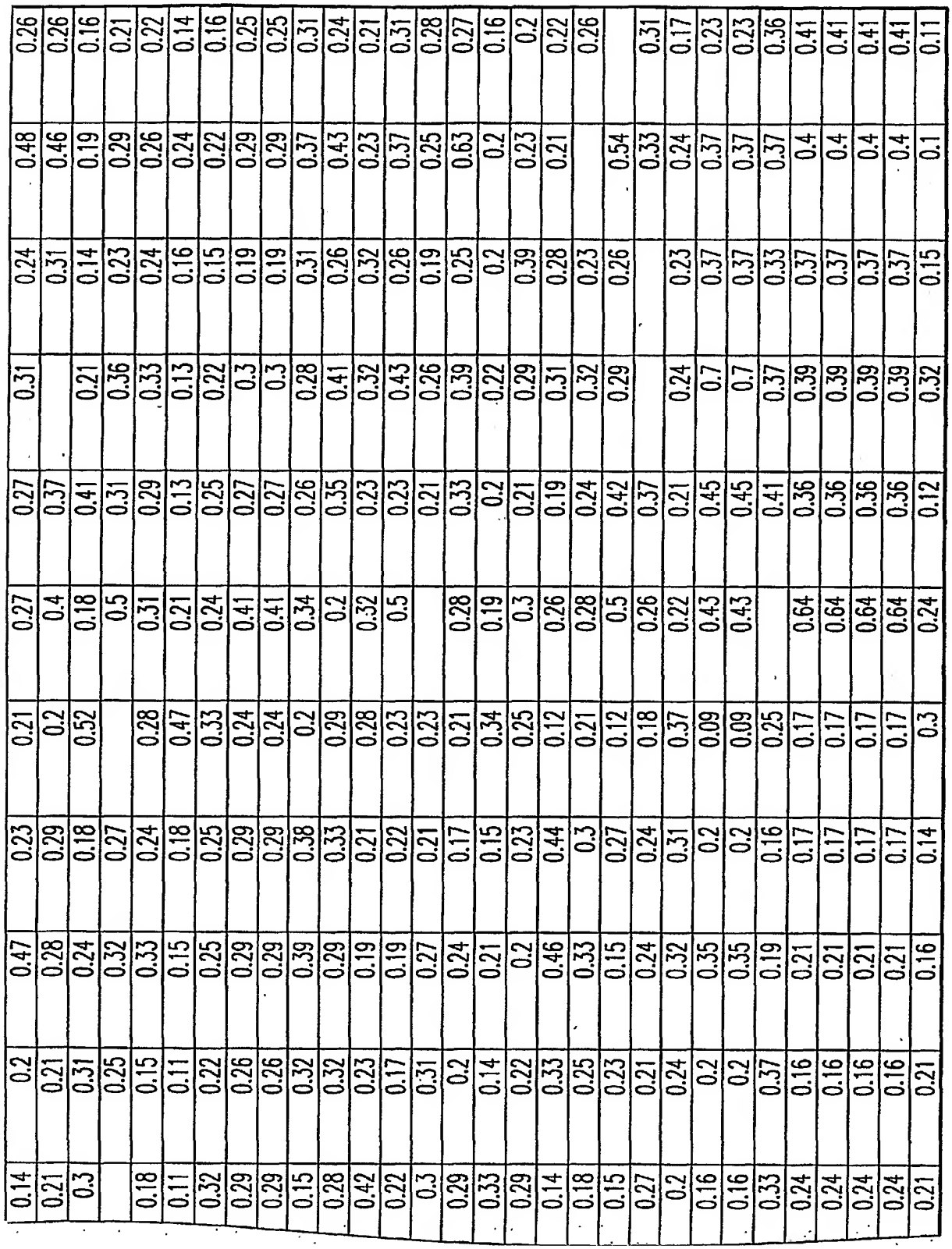
FIG.11-28A

0.42	0.18	0.27	0.22	0.28		0.35	0.33	0.31	0.38	0.35	
0.24	0.28	0.41	0.42	0.35	0.14	0.23	0.18	0.16	0.2	0.2	
0.36	0.19	0.28	0.22	0.29	0.36	0.24	0.32	0.14	0.24	0.14	
0.15	0.17	0.13	0.07	0.15	0.51	0.54	0.53	0.65	0.51	0.75	
0.2	0.21	0.21	0.18	0.19	0.5	0.43	0.41	0.37	0.38	0.46	
0.24	0.22	0.24	0.27	0.37	0.24	0.24	0.26	0.33	0.21	0.27	
0.17	0.39	0.34	0.3	0.15	0.35	0.56	0.39	0.31	0.43	0.36	
0.12	0.12	0.2	0.13	0.1	0.45	0.4	0.69	0.99	0.32	0.44	
0.2	0.2	0.23	0.17	0.22	0.36	0.31	0.69	0.3	0.37	0.25	
0.45	0.36	0.21	0.27	0.31	0.18	0.21	0.25	0.21	0.25	0.15	
0.21	0.45	0.22	0.35	0.2	0.27	0.19	0.2	0.23	0.17	0.2	
0.28	0.13	0.24	0.16	0.21	0.36	0.25	0.93	0.46	0.32	0.25	
0.29	0.21	0.27	0.27	0.36	0.29	0.26	0.33	0.23	0.23	0.4	
0.29	0.21	0.27	0.27	0.36	0.29	0.26	0.33	0.23	0.23	0.4	
0.39	0.2	0.22	0.28	0.47	0.34	0.21	0.27	0.3	0.3	0.2	
0.2	0.1	0.21	0.2	0.15	0.58	0.28	0.5	0.58	0.46	0.31	
0.24	0.16	0.24	0.18	0.31	0.19	0.27	0.62	0.21	0.3	0.2	
	0.28	0.29	0.28		0.35	0.32	0.27	0.29	0.32	0.15	
0.22	0.2	0.22	0.23	0.27	0.39	0.16	0.22	0.16	0.16	0.14	
0.19	0.21	0.4	0.32	0.21	0.31	0.26	0.28	0.26	0.32	0.24	
0.12	0.3	0.32	0.29	0.16	0.58	0.28	0.38	0.37	0.29	0.45	
0.33	0.15	0.19	0.17	0.49	0.23	0.18	0.38	0.21	0.24	0.18	
	0.15	0.15	0.15		0.41	0.35	0.34	0.34	0.37	0.31	
0.18	0.12	0.2	0.23	0.15	0.53	0.31	0.34	0.34	0.33	0.31	
	0.23	0.25	0.37		0.35	0.34	0.33	0.29	0.28	0.37	
0.18	0.22	0.36	0.24	0.25	0.28	0.21	0.29	0.16	0.23	0.19	
0.29	0.21	0.21	0.22	0.26	0.39	0.28	0.26	0.21	0.19	0.25	
0.12	0.15	0.21	0.14	0.09	0.58	0.48	0.74	0.51	0.58	0.53	
0.14	0.2	0.47	0.23	0.21	0.27	0.27	0.31	0.24	0.48	0.26	

FIG. 11-28B

0.277777778	RAMP3	0.13	0.2	0.24	0.55	0.34	0.22	0.24	
0.27647059	GADD45B	0.25	0.3	0.33	0.18	0.16	0.32	0.19	
0.276111111	NPGPR	0.26	0.22	0.24	0.47	0.27	0.35	0.32	
0.275714286	IRF4		0.21	0.23	0.2	0.18	0.3		
0.275555556	RI58	0.15	0.19	0.21	0.63	0.5	0.22	0.23	
0.275	C1S	0.08	0.1	0.8	0.64	0.78	0.24	0.28	
0.273888889	CHRND	0.26	0.24	0.19	0.52	0.5	0.37	0.24	
0.273888889	WISP1 v1	0.31	0.3	0.32	0.2	0.19	0.27	0.26	
0.273888889	WISP1 v2	0.31	0.3	0.32	0.2	0.19	0.27	0.26	
0.273888889	SLC6A4	0.32	0.3	0.18	0.12	0.16	0.33	0.21	
0.272777778	TNFRSF19L	0.24	0.2	0.24	0.14	0.14	0.29	0.26	
0.271111111	IFNA2	0.33	0.26	0.25	0.21	0.25	0.33	0.29	
0.270555556	PTGER2	0.24	0.25	0.24	0.3	0.25	0.24	0.22	
0.27	SGNE1	0.3	0.31	0.34	0.34	0.24	0.26	0.29	
0.27	TNFSF10	0.24	0.24	0.31	0.18	0.17	0.25	0.21	
0.269444444	NPY2R	0.22	0.19	0.36	0.56	0.57	0.24	0.37	
0.268333333	SCGN	0.3	0.27	0.31	0.26	0.29	0.32	0.27	
0.268333333	CD209	0.47	0.39	0.15	0.1	0.12	0.44	0.2	
0.268235294	GABRR2	0.27	0.27	0.34	0.41	0.27	0.2	0.2	
0.268235294	TGFB3	0.21	0.22	0.33	0.19	0.24	0.25	0.19	
0.268125	ABCA7 v1	0.2	0.18	0.33	0.39	0.27	0.19	0.32	
0.267777778	IL1F8	0.25	0.19	0.14	0.31	0.53	0.32	0.33	
0.267222222	FKBP1A v12A	0.22	0.25	0.16	0.1	0.09	0.28	0.16	
0.267222222	FKBP1A v12B	0.22	0.25	0.16	0.1	0.09	0.28	0.16	
0.267058824	PTPN2 v1	0.24	0.2	0.21	0.18	0.15	0.2	0.22	
0.266666667	TRPV1 v1	0.16	0.23	0.26	0.11	0.11	0.22	0.19	
0.266666667	TRPV1 v2	0.16	0.23	0.26	0.11	0.11	0.22	0.19	
0.266666667	TRPV1 v4	0.16	0.23	0.26	0.11	0.11	0.22	0.19	
0.266666667	TRPV1v3	0.16	0.23	0.26	0.11	0.11	0.22	0.19	
0.266111111	PPBP	0.28	0.48	0.6	0.28	0.25	0.45	0.39	

FIG.11-29A



0.14	0.2	0.47	0.23	0.21	0.27	0.27	0.31	0.24	0.48	0.26
0.21	0.21	0.28	0.29	0.2	0.4	0.37		0.31	0.46	0.26
0.3	0.31	0.24	0.18	0.52	0.18	0.41	0.21	0.14	0.19	0.16
	0.25	0.32	0.27		0.5	0.31	0.36	0.23	0.29	0.21
0.18	0.15	0.33	0.24	0.28	0.31	0.29	0.33	0.24	0.26	0.22
0.11	0.11	0.15	0.18	0.47	0.21	0.13	0.13	0.16	0.24	0.14
0.32	0.22	0.25	0.25	0.33	0.24	0.25	0.22	0.15	0.22	0.16
0.29	0.26	0.29	0.29	0.24	0.41	0.27	0.3	0.19	0.29	0.25
0.29	0.26	0.29	0.29	0.24	0.41	0.27	0.3	0.19	0.29	0.25
0.15	0.32	0.39	0.38	0.2	0.34	0.26	0.28	0.31	0.37	0.31
0.28	0.32	0.29	0.33	0.29	0.2	0.35	0.41	0.26	0.43	0.24
0.42	0.23	0.19	0.21	0.28	0.32	0.23	0.32	0.32	0.23	0.21
0.22	0.17	0.19	0.22	0.23	0.5	0.23	0.43	0.26	0.37	0.31
0.3	0.31	0.27	0.21	0.23		0.21	0.26	0.19	0.25	0.28
0.29	0.2	0.24	0.17	0.21	0.28	0.33	0.39	0.25	0.63	0.27
0.33	0.14	0.21	0.15	0.34	0.19	0.2	0.22	0.2	0.2	0.16
0.29	0.22	0.2	0.23	0.25	0.3	0.21	0.29	0.39	0.23	0.2
0.14	0.33	0.46	0.44	0.12	0.26	0.19	0.31	0.28	0.21	0.22
0.18	0.25	0.33	0.3	0.21	0.28	0.24	0.32	0.23		0.26
0.15	0.23	0.15	0.27	0.12	0.5	0.42	0.29	0.26	0.54	
0.27	0.21	0.24	0.24	0.18	0.26	0.37			0.33	0.31
0.2	0.24	0.32	0.31	0.37	0.22	0.21	0.24	0.23	0.24	0.17
0.16	0.2	0.35	0.2	0.09	0.43	0.45	0.7	0.37	0.37	0.23
0.16	0.2	0.35	0.2	0.09	0.43	0.45	0.7	0.37	0.37	0.23
0.33	0.37	0.19	0.16	0.25		0.41	0.37	0.33	0.37	0.36
0.24	0.16	0.21	0.17	0.17	0.64	0.36	0.39	0.37	0.4	0.41
0.24	0.16	0.21	0.17	0.17	0.64	0.36	0.39	0.37	0.4	0.41
0.24	0.16	0.21	0.17	0.17	0.64	0.36	0.39	0.37	0.4	0.41
0.24	0.16	0.21	0.17	0.17	0.64	0.36	0.39	0.37	0.4	0.41
0.21	0.21	0.16	0.14	0.3	0.24	0.12	0.32	0.15	0.1	0.11

FIG.11-29B

0.265882353	MASP1 v2	0.07	0.09	0.18	0.26	0.58	0.9	0.38
0.264444444	CYP17	0.11	0.15	0.33	0.2	0.18	0.25	0.21
0.263888889	MGST2	0.16	0.2	0.11	0.31	0.28	0.27	0.13
0.262777778	CD5	0.25	0.3	0.28	0.26	0.22	0.25	0.23
0.262352941	NAALAD2	0.08	0.15	0.17	0.07		0.24	0.09
0.262222222	MYD88	0.22	0.21	0.16	0.21	0.22	0.28	0.24
0.260555556	CHRNG	0.17	0.18	0.4	0.43	0.3	0.28	0.21
0.260555556	IL5RA	0.25	0.22	0.16	0.11	0.11	0.24	0.22
0.258125	LIFR	0.09	0.08	0.13	0.3	0.55	0.36	0.39
0.257222222	IL6	0.18	0.17	0.14	0.43	0.35	0.2	0.32
0.256666667	TPH	0.31	0.35	0.25	0.2	0.23	0.28	0.32
0.256666667	BDNF	0.11	0.09	1.55	0.36	0.42	0.16	0.34
0.256666667	PMX2B	0.28	0.38	0.22	0.11	0.09	0.63	0.13
0.254705882	PTPN22 v1	0.33	0.41	0.36	0.13	0.12	0.59	0.13
0.252777778	SAMHD1	0.28	0.27	0.46	0.19	0.24	0.39	0.21
0.251666667	CHRNA3	0.11	0.12	0.12	0.1	0.12	0.18	0.13
0.25125	NR0B1	0.17	0.19	0.43	0.36	0.28	0.18	0.26
0.251176471	ATM v1	0.25	0.25	0.38	0.19	0.16	0.41	0.15
0.250555556	NPR3	0.16	0.13	0.18	0.22	0.68	0.33	0.41
0.25	ANXA7 v2	0.23	0.31	0.27	0.19	0.27		0.19
0.25	HTR1F	0.12	0.1	1.32	0.48	0.33	0.17	0.29
0.25	LHX3	0.17	0.17	0.19	0.23	0.37	0.18	0.44
0.249444444	STAT5B	0.13	0.15	0.18	0.18	0.16	0.22	0.21
0.248888889	NCOA1 v1	0.35	0.38	0.4	0.1	0.26	0.63	0.18
0.248823529	GABRA3	0.13	0.14	0.15	0.15	0.15	0.22	0.18
0.2475	SLC25A20	0.08	0.15	0.28	0.51	0.75	0.27	0.26
0.247058824	ALDH8A1	0.24	0.29	0.25	0.22	0.27	0.54	0.27
0.245714286	TNFRSF13B	0.25	0.13	0.2	0.1	0.09	0.26	
0.245555556	PGRMC2	0.33	0.33	0.21	0.2	0.26	0.3	0.22
0.245555556	PCSK2	0.18	0.18	0.2	0.12	0.14	0.25	0.16

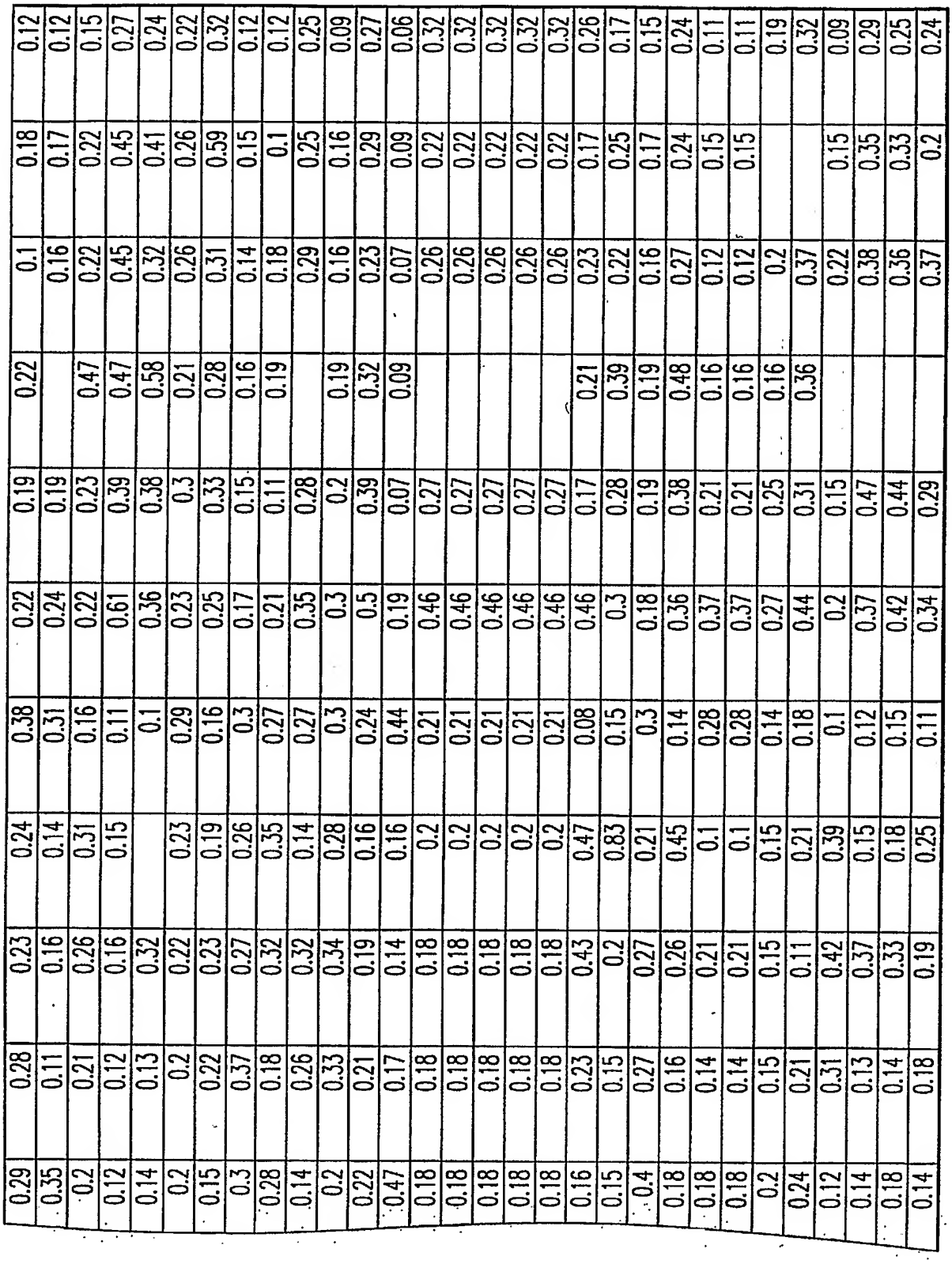
FIG.11-30A

0.13	0.14	0.17	0.13	0.46	0.23	0.21	0.22		0.24	0.13
0.17	0.15	0.3	0.18	0.18	0.42	0.31	0.66	0.4	0.32	0.24
0.13	0.17	0.29	0.19	0.21	0.42	0.45	0.46	0.26	0.36	0.35
0.22	0.25	0.24	0.32	0.23	0.32	0.24	0.35	0.3	0.25	0.22
0.06	0.08	0.26	0.21	0.08	0.87	0.37	0.5	0.23	0.6	0.4
0.16	0.24	0.23	0.24	0.17	0.25	0.46	0.34	0.46	0.31	0.32
0.31	0.22	0.24	0.2	0.38	0.26	0.21	0.18	0.28	0.24	0.2
0.18	0.22	0.27	0.22	0.17	0.45	0.36	0.54	0.24	0.3	0.43
0.17	0.31	0.33	0.27	0.28		0.33		0.15	0.3	0.09
0.31	0.17	0.2	0.17	0.28	0.27	0.28	0.55	0.19	0.15	0.27
0.35	0.29	0.3	0.27	0.33	0.23	0.15	0.22	0.19	0.16	0.19
0.21	0.11	0.13	0.09	0.27	0.17	0.11	0.2	0.12	0.1	0.08
0.19	0.31	0.3	0.26	0.21	0.27	0.25	0.35	0.2	0.19	0.25
0.23	0.38	0.24	0.35	0.15	0.29	0.14		0.16	0.13	0.19
0.17	0.12	0.24	0.18	0.21	0.37	0.19	0.3	0.27	0.22	0.24
0.09	0.08	0.14	0.14	0.12	0.44	0.46	0.84	0.43	0.64	0.27
0.24	0.16	0.26	0.22	0.25	0.38			0.3	0.18	0.16
0.22	0.25	0.19		0.19	0.23	0.23	0.28	0.44	0.22	0.23
0.44	0.27	0.24	0.21	0.38	0.24	0.15	0.09	0.1	0.2	0.08
0.14	0.32	0.3	0.36	0.15	0.43	0.23	0.23	0.21	0.16	0.26
0.23	0.11	0.15	0.13	0.33	0.14	0.14	0.12	0.12	0.1	0.12
0.58	0.13	0.19	0.14	0.41	0.21	0.18	0.4	0.17	0.19	0.15
0.22	0.1	0.22	0.21	0.17	0.33	0.34	0.85	0.29	0.32	0.21
0.24	0.36	0.22	0.31	0.2	0.22	0.12	0.16	0.12	0.11	0.12
0.17	0.11	0.22		0.15	0.38	0.37	0.78	0.36	0.35	0.22
0.25	0.13	0.19		0.41		0.11	0.14	0.18	0.14	0.11
0.2	0.2	0.22	0.3	0.17		0.22	0.29	0.19	0.19	0.14
	0.13	0.12	0.12		0.79	0.38	0.32	0.26		0.29
0.28	0.22	0.21	0.18	0.24	0.44	0.22	0.23	0.18	0.18	0.19
0.15	0.23	0.25	0.27	0.13	0.3	0.31	0.55	0.33	0.34	0.33

FIG.11-30B

0.24555556	MMP2	0.16	0.15	0.16	0.25	0.56	0.29	0.4
0.244705882	CGA	0.14	0.13	0.46	0.5	0.44	0.23	0.31
0.244444444	AIP	0.19	0.46	0.2	0.15	0.16	0.32	0.27
0.244444444	CHRNA2	0.11	0.13	0.25	0.13	0.14	0.18	0.16
0.244375	C8G	0.13	0.16	0.16	0.16	0.14		0.18
0.243888889	IL24	0.28	0.27	0.34	0.2	0.24	0.16	0.28
0.242222222	NELL2	0.21	0.25	0.21	0.11	0.13	0.22	0.2
0.242222222	RFXANK v1	0.37	0.36	0.36	0.15	0.16	0.31	0.26
0.242222222	CCRL2	0.23	0.29	0.46	0.16	0.2	0.43	0.28
0.241764706	EGR1	0.19	0.31	0.25	0.16	0.17	0.31	0.17
0.241666667	CFTR	0.16	0.16	0.17	0.2	0.46	0.27	0.38
0.241111111	IL17B	0.2	0.23	0.18	0.15	0.15	0.22	0.19
0.241111111	IRF5 v1	0.12	0.13	0.65	0.24	0.46	0.24	0.55
0.24	CASP1 vA	0.28	0.25	0.36	0.12	0.15	0.27	0.17
0.24	CASP1 vB	0.28	0.25	0.36	0.12	0.15	0.27	0.17
0.24	CASP1 vC	0.28	0.25	0.36	0.12	0.15	0.27	0.17
0.24	CASP1 vD	0.28	0.25	0.36	0.12	0.15	0.27	0.17
0.24	CASP1 vE	0.28	0.25	0.36	0.12	0.15	0.27	0.17
0.24	TSHB	0.28	0.31	0.16	0.04	0.06	0.49	0.11
0.239444444	TIMM23	0.14	0.15	0.19	0.19	0.17	0.23	0.15
0.238888889	LTBR	0.16	0.18	0.22	0.23	0.21	0.3	0.51
0.237777778	CEBPG	0.17	0.19	0.14	0.11	0.12	0.23	0.16
0.237222222	WISP3 v1	0.1	0.1	0.47	0.43	0.73	0.19	0.22
0.237222222	WISP3 v2	0.1	0.1	0.47	0.43	0.73	0.19	0.22
0.235882353	CCL26	0.13	0.2	0.14	0.56	0.09	0.18	0.85
0.235294118	HLA-DPA1	0.18	0.11	0.2	0.2	0.21	0.19	0.16
0.234705882	ADORA1	0.29	0.32	0.24	0.28	0.23	0.32	0.16
0.234375	MMP25	0.11	0.15	0.26	0.15	0.14		0.17
0.234117647	FCGR1A	0.12	0.19	0.23	0.11	0.11	0.25	0.19
0.23529412	OSMR	0.18	0.24	0.32	0.19	0.19	0.36	0.18

FIG.11-31A



0.29	0.28	0.23	0.24	0.38	0.22	0.19	0.22	0.1	0.18	0.12
0.35	0.11	0.16	0.14	0.31	0.24	0.19		0.16	0.17	0.12
0.2	0.21	0.26	0.31	0.16	0.22	0.23	0.47	0.22	0.22	0.15
0.12	0.12	0.16	0.15	0.11	0.61	0.39	0.47	0.45	0.45	0.27
0.14	0.13	0.32		0.1	0.36	0.38	0.58	0.32	0.41	0.24
0.2	0.2	0.22	0.23	0.29	0.23	0.3	0.21	0.26	0.26	0.22
0.15	0.22	0.23	0.19	0.16	0.25	0.33	0.28	0.31	0.59	0.32
0.3	0.37	0.27	0.26	0.3	0.17	0.15	0.16	0.14	0.15	0.12
0.28	0.18	0.32	0.35	0.27	0.21	0.11	0.19	0.18	0.1	0.12
0.14	0.26	0.32	0.14	0.27	0.35	0.28		0.29	0.25	0.25
0.2	0.33	0.34	0.28	0.3	0.3	0.2	0.19	0.16	0.16	0.09
0.22	0.21	0.19	0.16	0.24	0.5	0.39	0.32	0.23	0.29	0.27
0.47	0.17	0.14	0.16	0.44	0.19	0.07	0.09	0.07	0.09	0.06
0.18	0.18	0.18	0.2	0.21	0.46	0.27		0.26	0.22	0.32
0.18	0.18	0.18	0.2	0.21	0.46	0.27		0.26	0.22	0.32
0.18	0.18	0.18	0.2	0.21	0.46	0.27		0.26	0.22	0.32
0.18	0.18	0.18	0.2	0.21	0.46	0.27		0.26	0.22	0.32
0.16	0.23	0.43	0.47	0.08	0.46	0.17	0.21	0.23	0.17	0.26
0.15	0.15	0.2	0.83	0.15	0.3	0.28	0.39	0.22	0.25	0.17
0.4	0.27	0.27	0.21	0.3	0.18	0.19	0.19	0.16	0.17	0.15
0.18	0.16	0.26	0.45	0.14	0.36	0.38	0.48	0.27	0.24	0.24
0.18	0.14	0.21	0.1	0.28	0.37	0.21	0.16	0.12	0.15	0.11
0.18	0.14	0.21	0.1	0.28	0.37	0.21	0.16	0.12	0.15	0.11
0.2	0.15	0.15	0.15	0.14	0.27	0.25	0.16	0.2		0.19
0.24	0.21	0.11	0.21	0.18	0.44	0.31	0.36	0.37		0.32
0.12	0.31	0.42	0.39	0.1	0.2	0.15		0.22	0.15	0.09
0.14	0.13	0.37	0.15	0.12	0.37	0.47		0.38	0.35	0.29
0.18	0.14	0.33	0.18	0.15	0.42	0.44		0.36	0.33	0.25
0.14	0.18	0.19	0.25	0.11	0.34	0.29		0.37	0.2	0.24

FIG.11-31B

0.233333333	S100A12	0.21	0.18	0.46	0.32	0.28	0.3	0.2
0.233333333	SLAM	0.13	0.14	0.27	0.3	0.24	0.24	0.17
0.233333333	FADD	0.15	0.18	0.22	0.11	0.14	0.34	0.12
0.233125	CYP11B1	0.22	0.25	0.31	0.1	0.14	0.26	0.42
0.233125	CYP11B2	0.22	0.25	0.31	0.1	0.14	0.26	0.42
0.232941176	HSD3B1	0.05	0.06	0.09	0.04	0.03	0.13	0.08
0.232777778	NR2C1	0.15	0.18	0.35	0.36	0.3	0.23	0.22
0.232222222	TLR1	0.09	0.08	0.35	0.14	0.12	0.42	0.15
0.232222222	EN2	0.08	0.1	0.19	0.05	0.07	0.18	1.5
0.231764706	PER3	0.18	0.12	0.16	0.11	0.06		0.14
0.231666667	TNFRSF18 v1	0.11	0.13	0.1	0.03	0.04	0.17	0.07
0.230588235	BMX	0.19	0.26	0.29	0.2	0.2	0.26	0.2
0.230588235	NRG1 vndf43	0.13	0.13	0.15	0.17	0.25	0.26	0.24
0.23	INDO	0.1	0.15	0.14	0.04	0.06	0.24	0.08
0.229411765	NTRK2	0.23	0.22	0.26	0.21	0.22	0.29	0.18
0.228823529	IL1F5	0.15	0.19		0.19	0.4	0.23	0.22
0.228333333	TRPM2	0.22	0.21	0.19	0.13	0.61	0.27	0.22
0.227777778	CROT	0.21	0.17	0.23	0.13	0.21	0.28	0.22
0.2275	MBL2	0.2	0.23	0.18	0.26	0.2	0.24	0.29
0.226111111	RGN v1	0.1	0.11	0.26	0.16	0.11	0.34	0.24
0.225882353	ICSBP1	0.2	0.27	0.37	0.22	0.31		0.15
0.225555556	IFNAR2	0.25	0.25	0.16	0.05	0.07	0.27	0.19
0.225	PTPRC v1	0.25	0.32	0.26	0.08	0.09	0.27	0.23
0.225	PTPRC v2	0.25	0.32	0.26	0.08	0.09	0.27	0.23
0.225	PTPRC v3	0.25	0.32	0.26	0.08	0.09	0.27	0.23
0.225	TIAF1 v1	0.1	0.12	0.32	0.24	0.14	0.19	0.17
0.22444444	FLT3	0.19	0.23	0.51	0.16	0.12	0.3	0.17
0.224117647	CASP3 va	0.15	0.23	0.33	0.13	0.2	0.31	0.26
0.224117647	CASP3 vb	0.15	0.23	0.33	0.13	0.2	0.31	0.26
0.224117647	DLK1	0.24	0.22	0.25	0.15	0.12	0.38	0.09

yes yes

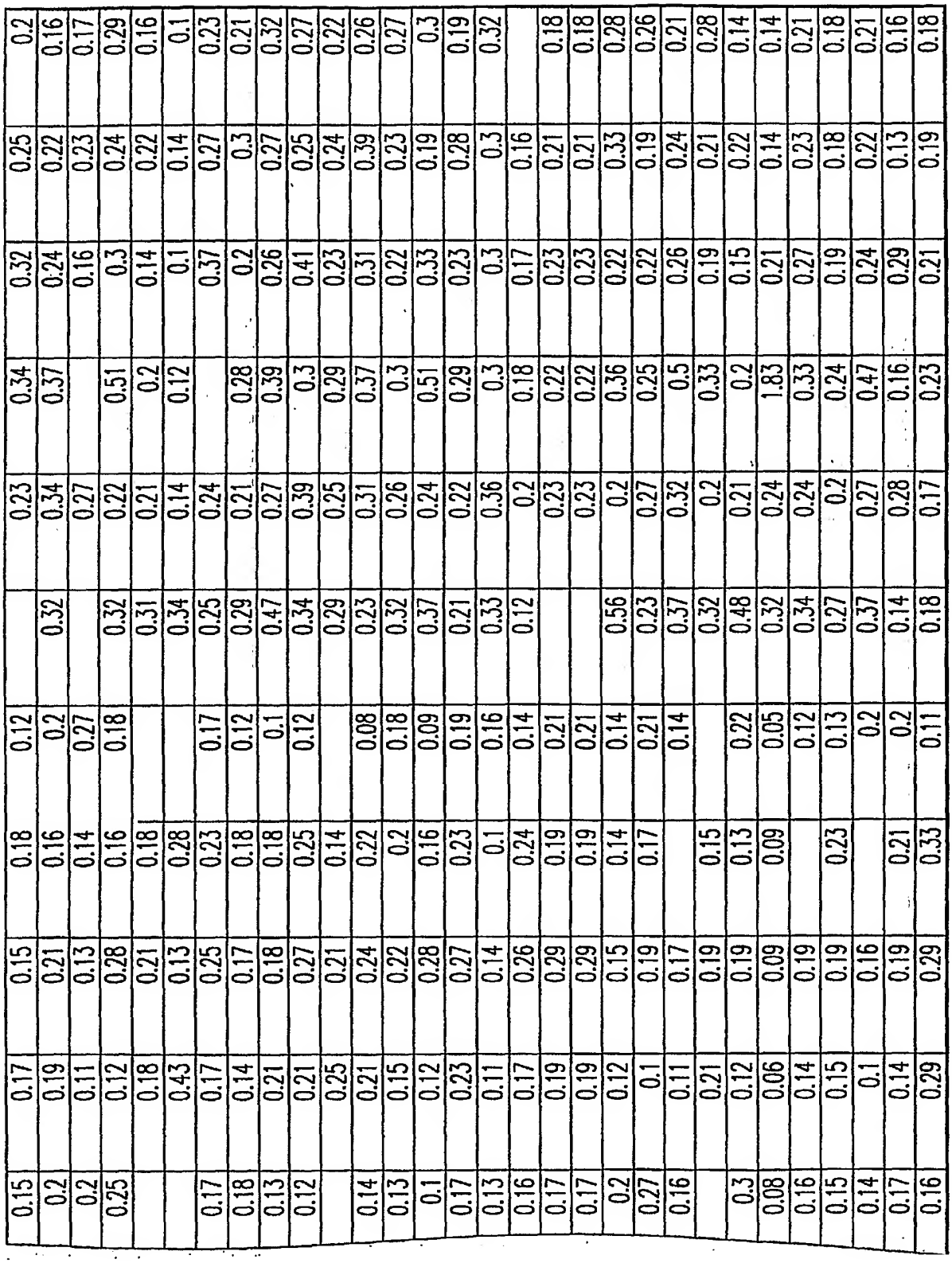
FIG.11-32A

0.23	0.1	0.19	0.14	0.2	0.3	0.21	0.23	0.25	0.23	0.17
0.17	0.15	0.23	0.18	0.17	0.34	0.25	0.42	0.3	0.29	0.21
0.11	0.19	0.22	0.16	0.09	0.44	0.22	0.32	0.44	0.36	0.39
0.4	0.19	0.24		0.28		0.17	0.25	0.16	0.17	0.17
0.4	0.19	0.24		0.28		0.17	0.25	0.16	0.17	0.17
0.09	0.04	0.06		0.05	1.36	0.34	0.5	0.48	0.28	0.28
0.25	0.18	0.19	0.22	0.25	0.22	0.22	0.28	0.16	0.26	0.17
0.11	0.13	0.26	0.15	0.23	0.55	0.28	0.3	0.19	0.43	0.2
0.25	0.05	0.21	0.1	0.08	0.27	0.19	0.32	0.17	0.19	0.18
0.12	0.11	0.2	0.15	0.08	0.37	0.41	0.86	0.3	0.38	0.19
0.08	0.12	0.15	0.22	0.04	0.28	0.54	0.8	0.39	0.42	0.48
0.15	0.21	0.27	0.27		0.26	0.28	0.27	0.18	0.2	0.23
0.18	0.33		0.29	0.18	0.25	0.3	0.28	0.28	0.33	0.17
0.08	0.1	0.16	0.16	0.07	0.32	0.51	0.41	0.47	0.61	0.44
0.17	0.19	0.23	0.3	0.18	0.28	0.22		0.27	0.21	0.24
0.15	0.15	0.3	0.18	0.28	0.23	0.26	0.24	0.14	0.33	0.25
0.12	0.24	0.31	0.31	0.06	0.19	0.27	0.07	0.12	0.34	0.23
0.22	0.1	0.15	0.13	0.22	0.42	0.24	0.45	0.25	0.28	0.19
0.25	0.18	0.21	0.17	0.21		0.37		0.15	0.19	0.31
0.22	0.1	0.21	0.1	0.16	0.34	0.3	0.62	0.28	0.25	0.17
0.18	0.21	0.19	0.19	0.22	0.3	0.24	0.24	0.19	0.18	0.18
0.11	0.15	0.29	0.35	0.09	0.41	0.25	0.3	0.26	0.32	0.29
0.32	0.12	0.15	0.11	0.23	0.54	0.27	0.3	0.18	0.18	0.15
0.32	0.12	0.15	0.11	0.23	0.54	0.27	0.3	0.18	0.18	0.15
0.32	0.12	0.15	0.11	0.23	0.54	0.27	0.3	0.18	0.18	0.15
0.13	0.07	0.1	0.09	0.15	0.43	0.22	0.32	0.46	0.38	0.42
0.16	0.11	0.18	0.2	0.17	0.44	0.18	0.26	0.22	0.19	0.25
0.18	0.2	0.3	0.2	0.2	0.34	0.25		0.19	0.18	0.16
0.18	0.2	0.3	0.2	0.2	0.34	0.25		0.19	0.18	0.16
0.12		0.24	0.22	0.16	0.32	0.2	0.48	0.25	0.2	0.17

FIG. 11-32B

0.223529412	SCN1A	0.29	0.34	0.11	0.11	0.13	0.44	0.27	
0.223333333	MICA	0.15	0.15	0.16	0.22	0.26	0.18	0.29	
0.223125	IL18R1	0.13	0.17	0.8	0.14	0.18	0.24	0.23	
0.222777778	ERBB3	0.13	0.13	0.17	0.12	0.19	0.2	0.2	
0.222	RAF1	0.14	0.14	0.21	0.39	0.47	0.17		
0.222	CCL22	0.46	0.43	0.09	0.05	0.05	0.47		
0.220588235	PENK	0.16	0.21	0.33	0.11	0.13	0.3	0.16	
0.220555556	GMFB	0.31	0.31	0.21	0.08	0.07	0.58	0.13	
0.220555556	LTB4R2	0.26	0.23	0.14	0.06	0.08	0.27	0.15	
0.219411765	IL18BP	0.2	0.15	0.1	0.06	0.07		0.22	
0.219333333	CD8A	0.3	0.24	0.12	0.12	0.08	0.31		
0.218333333	IL9R	0.18	0.17	0.15	0.12	0.17	0.24	0.14	
0.218333333	HCRT	0.22	0.2	0.25	0.16	0.22	0.24	0.16	
0.218333333	CYP2F1	0.27	0.24	0.19	0.08	0.12	0.22	0.12	
0.217777778	TFPI	0.13	0.26	0.22	0.28	0.22	0.19	0.11	
0.217777778	PTCH2	0.18	0.19	0.21	0.13	0.13	0.34	0.19	
0.217647059	CALCRL	0.28	0.26	0.33	0.1	0.11	0.55	0.27	
0.217058824	CCR9 vA	0.16	0.19	0.24	0.27	0.24	0.24	0.23	
0.217058824	CCR9 vB	0.16	0.19	0.24	0.27	0.24	0.24	0.23	
0.216666667	SOCS1	0.17	0.19	0.28	0.07	0.1	0.22	0.17	
0.215555556	CADPS	0.2	0.2	0.18	0.19	0.26	0.31	0.18	
0.214117647	ICEBERG.	0.17	0.13	0.17	0.12	0.22	0.21	0.14	
0.214	GABRR1	0.23	0.24	0.26	0.1	0.11	0.19		
0.213888889	NRF	0.17	0.18	0.27	0.15	0.18	0.26	0.28	
0.213888889	SCN7A	0.08	0.08	0.11	0.04	0.04	0.18	0.07	
0.213529412	ADRA2A	0.13	0.14	0.28	0.24	0.22	0.18	0.21	
0.212941176	NFKBIL1	0.19	0.62	0.28	0.13	0.12		0.17	
0.212352941	NYREN18	0.12	0.14	0.2	0.17	0.27	0.18	0.15	
0.211666667	CR2	0.15	0.16	0.32	0.27	0.25	0.35	0.24	
0.211666667	NFRKB	0.29	0.28	0.16	0.1	0.12	0.33	0.19	

FIG.11-33A

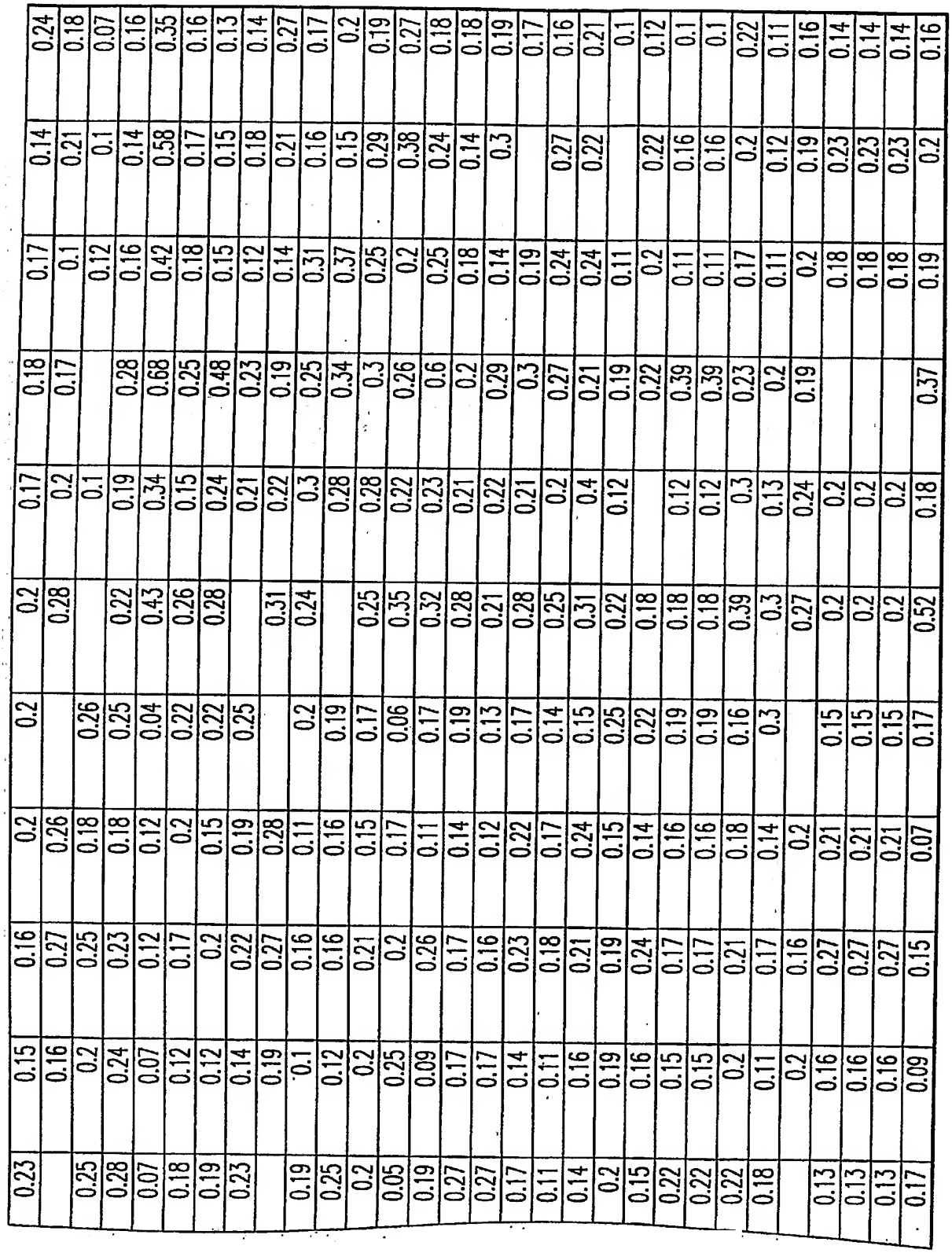


0.15	0.17	0.15	0.18	0.12		0.23	0.34	0.32	0.25	0.2
0.2	0.19	0.21	0.16	0.2	0.32	0.34	0.37	0.24	0.22	0.16
0.2	0.11	0.13	0.14	0.27		0.27		0.16	0.23	0.17
0.25	0.12	0.28	0.16	0.18	0.32	0.22	0.51	0.3	0.24	0.29
	0.18	0.21	0.18		0.31	0.21	0.2	0.14	0.22	0.16
	0.43	0.13	0.28		0.34	0.14	0.12	0.1	0.14	0.1
0.17	0.17	0.25	0.23	0.17	0.25	0.24		0.37	0.27	0.23
0.18	0.14	0.17	0.18	0.12	0.29	0.21	0.28	0.2	0.3	0.21
0.13	0.21	0.18	0.18	0.1	0.47	0.27	0.39	0.26	0.27	0.32
0.12	0.21	0.27	0.25	0.12	0.34	0.39	0.3	0.41	0.25	0.27
	0.25	0.21	0.14		0.29	0.25	0.29	0.23	0.24	0.22
0.14	0.21	0.24	0.22	0.08	0.23	0.31	0.37	0.31	0.39	0.26
0.13	0.15	0.22	0.2	0.18	0.32	0.26	0.3	0.22	0.23	0.27
0.1	0.12	0.28	0.16	0.09	0.37	0.24	0.51	0.33	0.19	0.3
0.17	0.23	0.27	0.23	0.19	0.21	0.22	0.29	0.23	0.28	0.19
0.13	0.11	0.14	0.1	0.16	0.33	0.36	0.3	0.3	0.3	0.32
0.16	0.17	0.26	0.24	0.14	0.12	0.2	0.18	0.17	0.16	
0.17	0.19	0.29	0.19	0.21		0.23	0.22	0.23	0.21	0.18
0.17	0.19	0.29	0.19	0.21		0.23	0.22	0.23	0.21	0.18
0.2	0.12	0.15	0.14	0.14	0.56	0.2	0.36	0.22	0.33	0.28
0.27	0.1	0.19	0.17	0.21	0.23	0.27	0.25	0.22	0.19	0.26
0.16	0.11	0.17		0.14	0.37	0.32	0.5	0.26	0.24	0.21
	0.21	0.19	0.15		0.32	0.2	0.33	0.19	0.21	0.28
0.3	0.12	0.19	0.13	0.22	0.48	0.21	0.2	0.15	0.22	0.14
0.08	0.06	0.09	0.09	0.05	0.32	0.24	1.83	0.21	0.14	0.14
0.16	0.14	0.19		0.12	0.34	0.24	0.33	0.27	0.23	0.21
0.15	0.15	0.19	0.23	0.13	0.27	0.2	0.24	0.19	0.18	0.18
0.14	0.1	0.16		0.2	0.37	0.27	0.47	0.24	0.22	0.21
0.17	0.14	0.19	0.21	0.2	0.14	0.28	0.16	0.29	0.13	0.16
0.16	0.29	0.29	0.33	0.11	0.18	0.17	0.23	0.21	0.19	0.18

FIG.11-33B

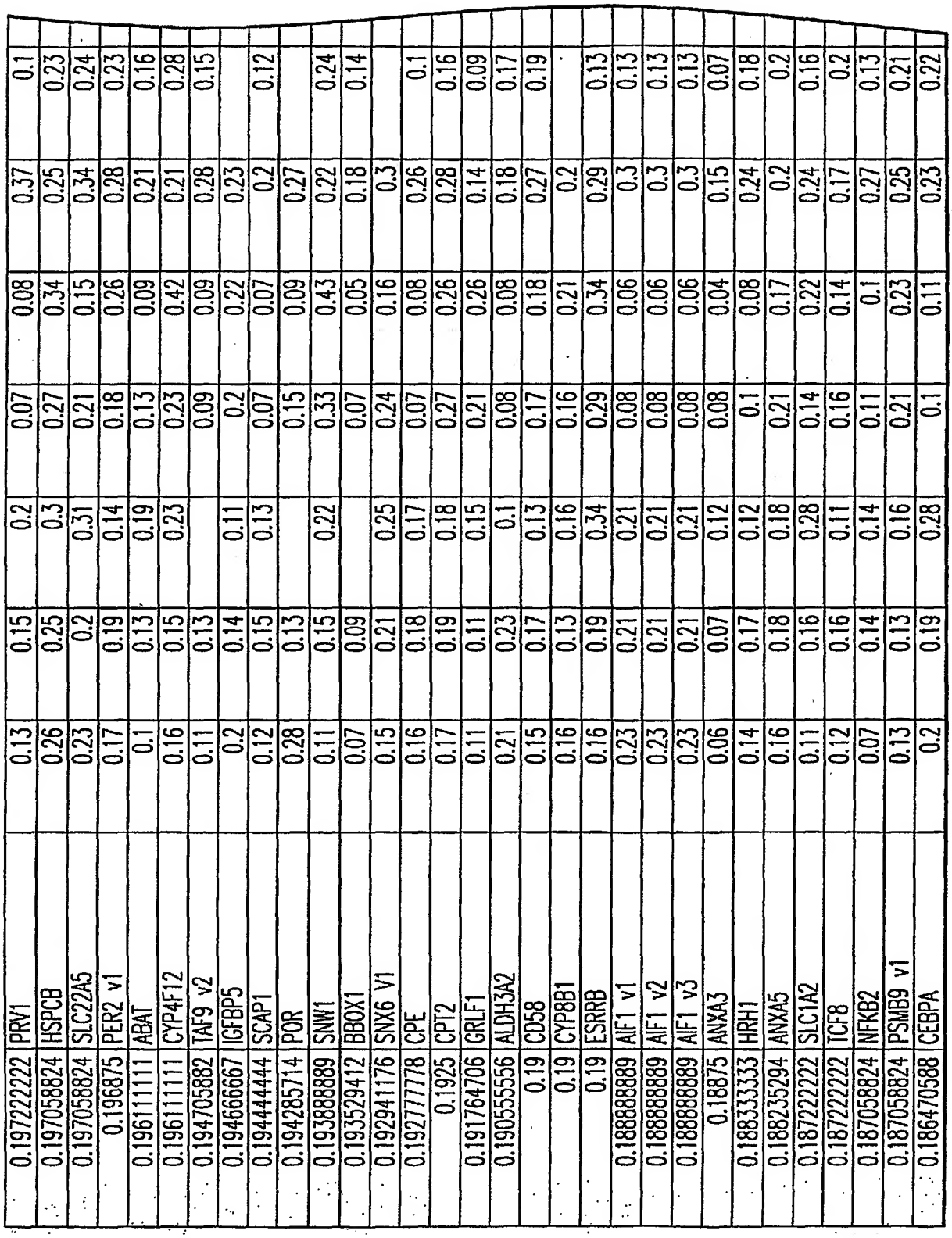
0.210555556	CTSD	0.23	0.22	0.25	0.21	0.15	0.3	0.39	
0.21	CCL1	0.19	0.17	0.3	0.19	0.26	0.21		
0.21	HSPA1L	0.3	0.34	0.27	0.19	0.2	0.35	0.18	
0.209444444	NR3C1	0.29	0.28	0.2	0.07	0.07	0.26	0.27	
0.209444444	CD3G	0.06	0.08	0.11	0.03	0.03	0.17	0.07	
0.209444444	UBP1	0.13	0.16	0.38	0.34	0.24	0.22	0.24	
0.209444444	CMKLR1	0.13	0.13	0.12	0.35	0.33	0.2	0.2	
0.209411765	SLC1A3	0.22	0.23	0.19	0.35	0.22	0.27	0.17	
0.208666667	CYP2S1	0.17	0.14	0.14	0.15	0.13	0.32		
0.207777778	IL1RL1	0.12	0.14	0.24	0.33	0.33	0.21	0.18	
0.207647059	IL10	0.17	0.15	0.22	0.19	0.23	0.17	0.18	
0.207647059	KPNB2	0.24	0.2		0.15	0.12	0.14	0.19	
0.207222222	TH	0.19	0.34	0.22	0.1	0.1	0.3	0.07	
0.207058824	CTSB v1	0.08	0.12	0.28	0.08	0.07		0.25	
0.203888889	HMOX2	0.2	0.2	0.32	0.17	0.24	0.22	0.19	
0.203888889	ZNF161	0.15	0.15	0.3	0.21	0.21	0.22	0.23	
0.203529412	HTR3A	0.12	0.14	0.26	0.21	0.18	0.21	0.26	
0.203333333	ANXA6 v1	0.16	0.15	0.48	0.2	0.15	0.27	0.15	
0.202777778	GABARAP	0.14	0.15	0.11	0.24	0.15	0.18	0.19	
0.202352941	AKAP9 v2	0.26	0.2	0.13	0.44	0.26	0.3	0.13	
0.201764706	TGFB1	0.17	0.15	0.19	0.23	0.43	0.23	0.18	
0.201666667	CYP19 v1	0.15	0.16	0.32	0.32	0.28	0.21	0.24	
0.201666667	CYP19 v2	0.15	0.16	0.32	0.32	0.28	0.21	0.24	
0.2	IFNGR1	0.1	0.1	0.11	0.13	0.19	0.22	0.27	
0.2	IL18RAP	0.12	0.12	0.19	0.29	0.51	0.29	0.21	
0.199333333	IL13	0.24	0.28	0.18	0.12	0.09	0.27		
0.197647059	NR1I2 v1	0.22	0.22	0.4	0.18	0.12	0.18	0.17	
0.197647059	NR1I2 v2	0.22	0.22	0.4	0.18	0.12	0.18	0.17	
0.197647059	NR1I2 v3	0.22	0.22	0.4	0.18	0.12	0.18	0.17	
0.197222222	LCP1	0.24	0.22	0.23	0.11	0.08	0.27	0.13	

FIG.11-34A



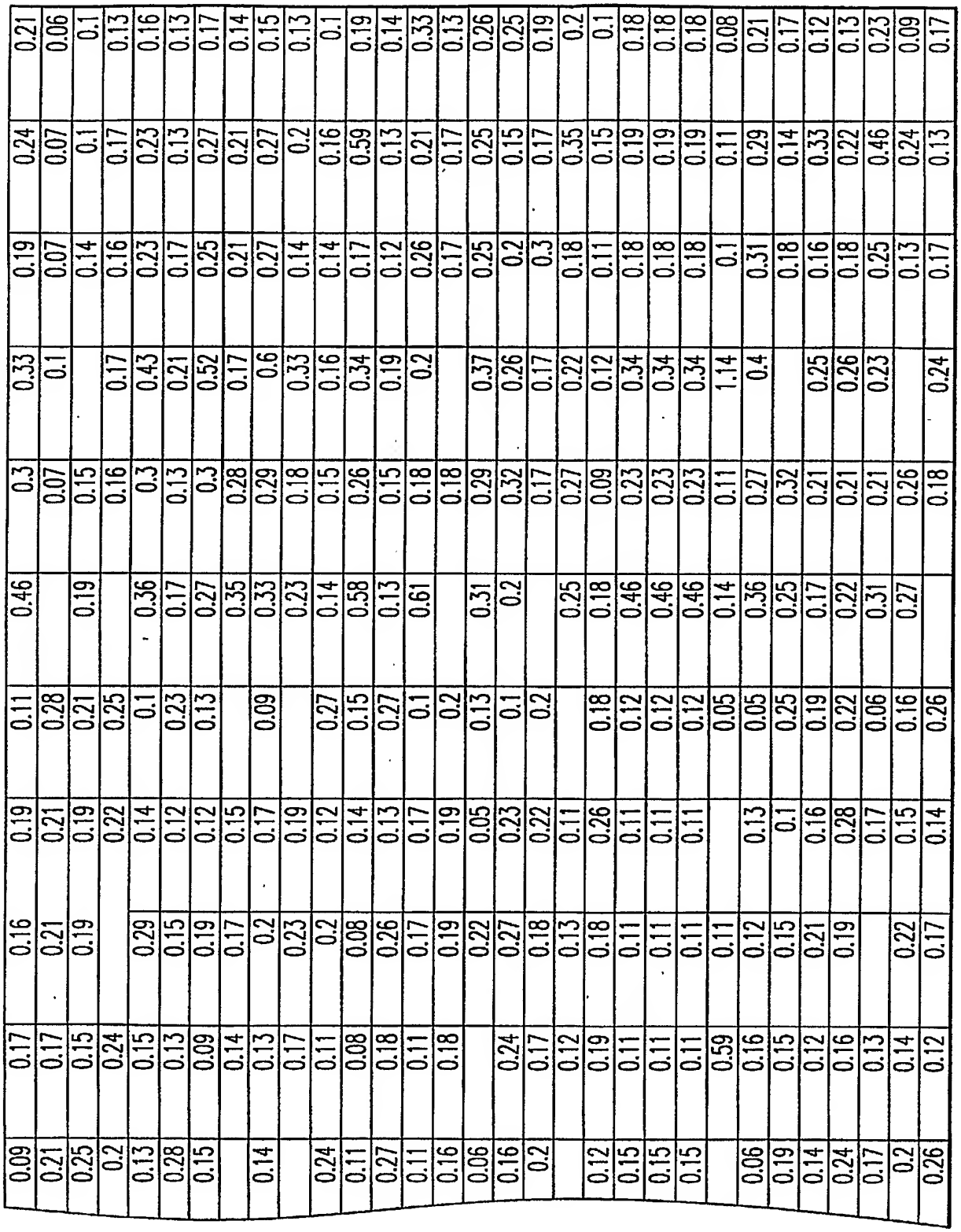
0.23	0.15	0.16	0.2	0.2	0.2	0.17	0.18	0.17	0.14	0.24		
	0.16	0.27	0.26		0.28	0.2	0.17	0.1	0.21	0.18		
0.25	0.2	0.25	0.18	0.26		0.1		0.12	0.1	0.07		
0.28	0.24	0.23	0.18	0.25	0.22	0.19	0.28	0.16	0.14	0.16		
0.07	0.07	0.12	0.12	0.04	0.43	0.34	0.68	0.42	0.58	0.35		
0.18	0.12	0.17	0.2	0.22	0.26	0.15	0.25	0.18	0.17	0.16		
0.19	0.12	0.2	0.15	0.22	0.28	0.24	0.48	0.15	0.15	0.13		
0.23	0.14	0.22	0.19	0.25		0.21	0.23	0.12	0.18	0.14		
	0.19	0.27	0.28		0.31	0.22	0.19	0.14	0.21	0.27		
0.19	0.1	0.16	0.11	0.2	0.24	0.3	0.25	0.31	0.16	0.17		
0.25	0.12	0.16	0.16	0.19		0.28	0.34	0.37	0.15	0.2		
0.2	0.2	0.21	0.15	0.17	0.25	0.28	0.3	0.25	0.29	0.19		
0.05	0.25	0.2	0.17	0.06	0.35	0.22	0.26	0.2	0.38	0.27		
0.19	0.09	0.26	0.11	0.17	0.32	0.23	0.6	0.25	0.24	0.18		
0.27	0.17	0.17	0.14	0.19	0.28	0.21	0.2	0.18	0.14	0.18		
0.27	0.17	0.16	0.12	0.13	0.21	0.22	0.29	0.14	0.3	0.19		
0.17	0.14	0.23	0.22	0.17	0.28	0.21	0.3	0.19		0.17		
0.11	0.11	0.18	0.17	0.14	0.25	0.2	0.27	0.24	0.27	0.16		
0.14	0.16	0.21	0.24	0.15	0.31	0.4	0.21	0.24	0.22	0.21		
0.2	0.19	0.19	0.15	0.25	0.22	0.12	0.19	0.11		0.1		
0.15	0.16	0.24	0.14	0.22	0.18		0.22	0.2	0.22	0.12		
0.22	0.15	0.17	0.16	0.19	0.18	0.12	0.39	0.11	0.16	0.1		
0.22	0.15	0.17	0.16	0.19	0.18	0.12	0.39	0.11	0.16	0.1		
0.22	0.2	0.21	0.18	0.16	0.39	0.3	0.23	0.17	0.2	0.22		
0.18	0.11	0.17	0.14	0.3	0.3	0.13	0.2	0.11	0.12	0.11		
	0.2	0.16	0.2		0.27	0.24	0.19	0.2	0.19	0.16		
0.13	0.16	0.27	0.21	0.15	0.2	0.2		0.18	0.23	0.14		
0.13	0.16	0.27	0.21	0.15	0.2	0.2		0.18	0.23	0.14		
0.13	0.16	0.27	0.21	0.15	0.2	0.2		0.18	0.23	0.14		
0.17	0.09	0.15	0.07	0.17	0.52	0.18	0.37	0.19	0.2	0.16		

FIG. 11-34B



0.19722222	PRV1	0.13	0.15	0.2	0.07	0.08	0.37	0.1	
0.19705824	HSPCB	0.26	0.25	0.3	0.27	0.34	0.25	0.23	
0.19705824	SLC22A5	0.23	0.2	0.31	0.21	0.15	0.34	0.24	
0.196875	PER2 v1	0.17	0.19	0.14	0.18	0.26	0.28	0.23	
0.196111111	ABAT	0.1	0.13	0.19	0.13	0.09	0.21	0.16	
0.196111111	CYP4F12	0.16	0.15	0.23	0.23	0.42	0.21	0.28	
0.194705882	TAF9 v2	0.11	0.13		0.09	0.09	0.28	0.15	
0.194666667	IGFBP5	0.2	0.14	0.11	0.2	0.22	0.23		
0.194444444	SCAP1	0.12	0.15	0.13	0.07	0.07	0.2	0.12	
0.194285714	POR	0.28	0.13		0.15	0.09	0.27		
0.193888889	SNW1	0.11	0.15	0.22	0.33	0.43	0.22	0.24	
0.193529412	BBOX1	0.07	0.09		0.07	0.05	0.18	0.14	
0.192941176	SNX6 V1	0.15	0.21	0.25	0.24	0.16	0.3		
0.192777778	CPE	0.16	0.18	0.17	0.07	0.08	0.26	0.1	
0.1925	CPT2	0.17	0.19	0.18	0.27	0.26	0.28	0.16	
0.191764706	GRLF1	0.11	0.11	0.15	0.21	0.26	0.14	0.09	
0.190555556	ALDH3A2	0.21	0.23	0.1	0.08	0.08	0.18	0.17	
0.19	CD58	0.15	0.17	0.13	0.17	0.18	0.27	0.19	
0.19	CYP8B1	0.16	0.13	0.16	0.16	0.21	0.2		
0.19	ESRRB	0.16	0.19	0.34	0.29	0.34	0.29	0.13	
0.188888889	AIF1 v1	0.23	0.21	0.21	0.08	0.06	0.3	0.13	
0.188888889	AIF1 v2	0.23	0.21	0.21	0.08	0.06	0.3	0.13	
0.188888889	AIF1 v3	0.23	0.21	0.21	0.08	0.06	0.3	0.13	
0.18875	ANXA3	0.06	0.07	0.12	0.08	0.04	0.15	0.07	
0.188333333	HRH1	0.14	0.17	0.12	0.1	0.08	0.24	0.18	
0.188235294	ANXA5	0.16	0.18	0.18	0.21	0.17	0.2	0.2	
0.187222222	SLC1A2	0.11	0.16	0.28	0.14	0.22	0.24	0.16	
0.187222222	TCF8	0.12	0.16	0.11	0.16	0.14	0.17	0.2	
0.187058824	NFKB2	0.07	0.14	0.14	0.11	0.1	0.27	0.13	
0.187058824	PSMB9 v1	0.13	0.13	0.16	0.21	0.23	0.25	0.21	
0.186470588	CEBPA	0.2	0.19	0.28	0.1	0.11	0.23	0.22	

FIG.11-35A

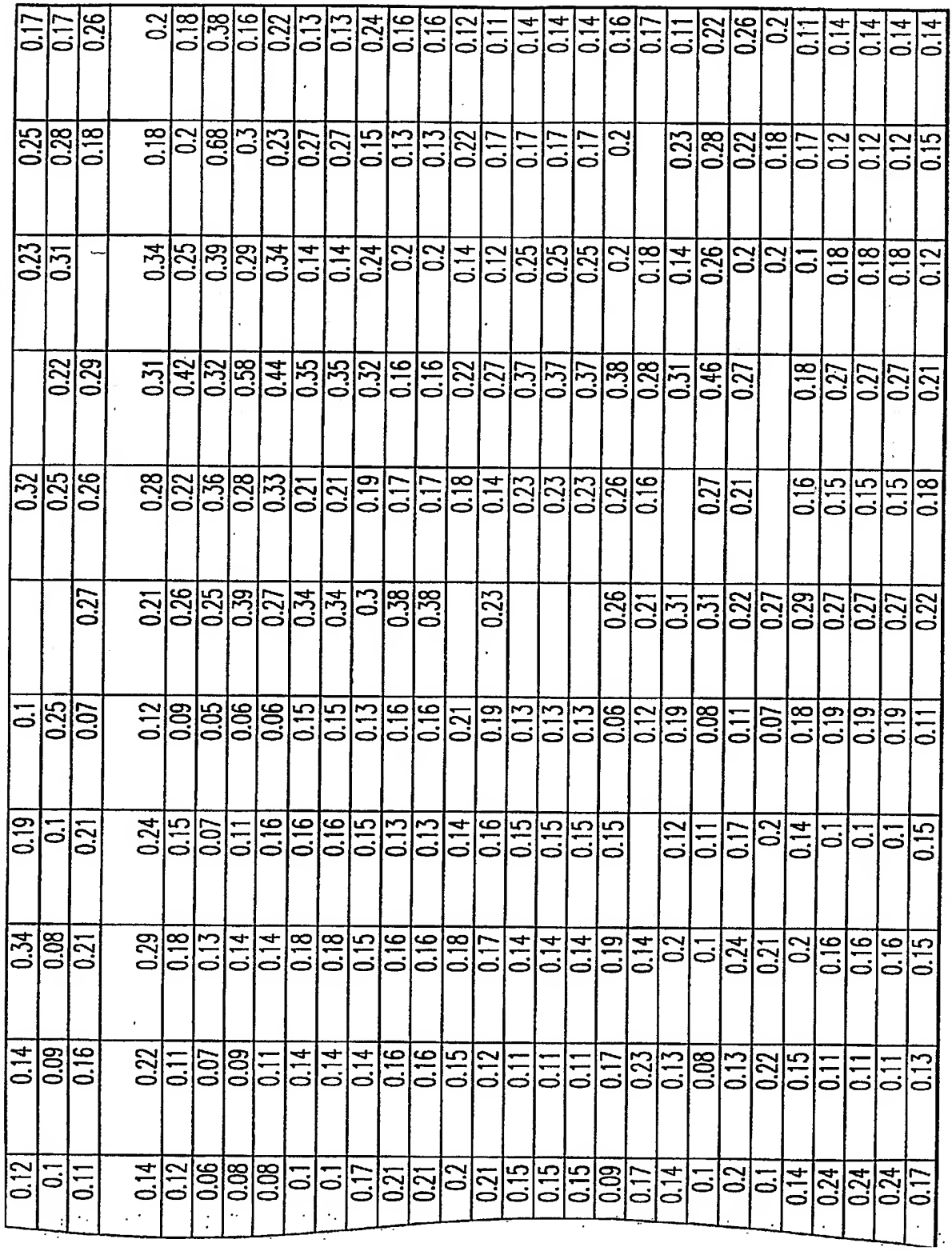


0.09	0.17	0.16	0.19	0.11	0.46	0.3	0.33	0.19	0.24	0.21			
0.21	0.17	0.21	0.21	0.28		0.07	0.1	0.07	0.07	0.06			
0.25	0.15	0.19	0.19	0.21	0.19	0.15		0.14	0.1	0.1			
0.2	0.24		0.22	0.25		0.16	0.17	0.16	0.17	0.13			
0.13	0.15	0.29	0.14	0.1	0.36	0.3	0.43	0.23	0.23	0.16			
0.28	0.13	0.15	0.12	0.23	0.17	0.13	0.21	0.17	0.13	0.13			
0.15	0.09	0.19	0.12	0.13	0.27	0.3	0.52	0.25	0.27	0.17			
	0.14	0.17	0.15		0.35	0.28	0.17	0.21	0.21	0.14			
0.14	0.13	0.2	0.17	0.09	0.33	0.29	0.6	0.27	0.27	0.15			
	0.17	0.23	0.19		0.23	0.18	0.33	0.14	0.2	0.13			
0.24	0.11	0.2	0.12	0.27	0.14	0.15	0.16	0.14	0.16	0.1			
0.11	0.08	0.08	0.14	0.15	0.58	0.26	0.34	0.17	0.59	0.19			
0.27	0.18	0.26	0.13	0.27	0.13	0.15	0.19	0.12	0.13	0.14			
0.11	0.11	0.17	0.17	0.1	0.61	0.18	0.2	0.26	0.21	0.33			
0.16	0.18	0.19	0.19	0.2		0.18		0.17	0.17	0.13			
0.06		0.22	0.05	0.13	0.31	0.29	0.37	0.25	0.25	0.26			
0.16	0.24	0.27	0.23	0.1	0.2	0.32	0.26	0.2	0.15	0.25			
0.2	0.17	0.18	0.22	0.2		0.17	0.17	0.3	0.17	0.19			
	0.12	0.13	0.11		0.25	0.27	0.22	0.18	0.35	0.2			
0.12	0.19	0.18	0.26	0.18	0.18	0.09	0.12	0.11	0.15	0.1			
0.15	0.11	0.11	0.11	0.12	0.46	0.23	0.34	0.18	0.19	0.18			
0.15	0.11	0.11	0.11	0.12	0.46	0.23	0.34	0.18	0.19	0.18			
0.15	0.11	0.11	0.11	0.12	0.46	0.23	0.34	0.18	0.19	0.18			
	0.59	0.11		0.05	0.14	0.11	1.14	0.1	0.11	0.08			
0.06	0.16	0.12	0.13	0.05	0.36	0.27	0.4	0.31	0.29	0.21			
0.19	0.15	0.15	0.1	0.25	0.25	0.32		0.18	0.14	0.17			
0.14	0.12	0.21	0.16	0.19	0.17	0.21	0.25	0.16	0.33	0.12			
0.24	0.16	0.19	0.28	0.22	0.22	0.21	0.26	0.18	0.22	0.13			
0.17	0.13		0.17	0.06	0.31	0.21	0.23	0.25	0.46	0.23			
0.2	0.14	0.22	0.15	0.16	0.27	0.26		0.13	0.24	0.09			
0.26	0.12	0.17	0.14	0.26		0.18	0.24	0.17	0.13	0.17			

FIG.11-35B

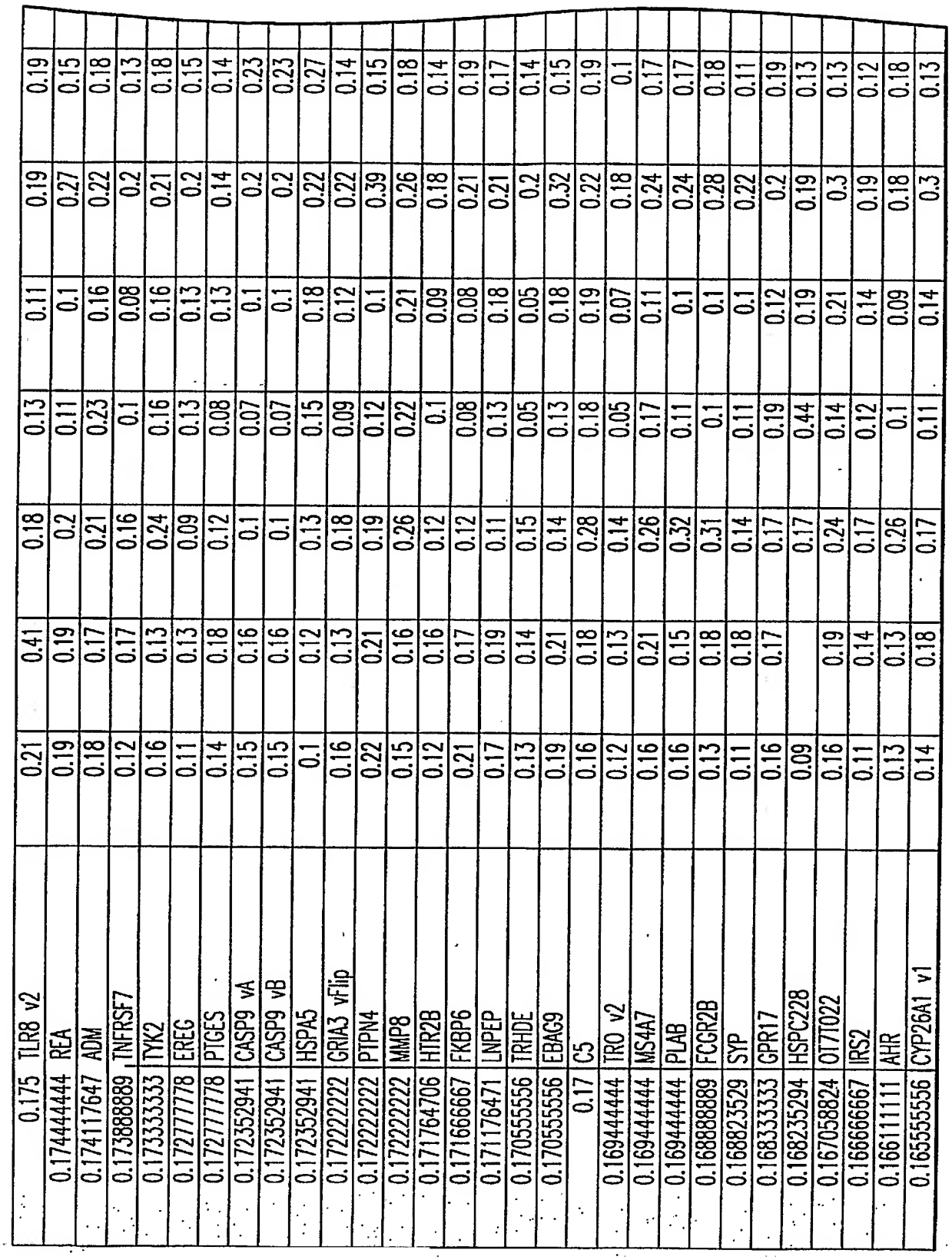
0.184375	HTR5A	0.13	0.15	0.16	0.11	0.12	0.3	0.12	
0.18411764	CHRNA9	0.07	0.11	0.24	0.24	0.21	0.2	0.21	
0.18352941	GABBR1 v2	0.15	0.15	0.19	0.08	0.08	0.29	0.16	
0.18333333	NRG1 vHRG-gamma	0.14	0.1	0.09	0.1	0.12	0.16	0.06	
0.18277778	HIP1	0.11	0.2	0.2	0.12	0.11	0.24	0.13	
0.18277778	HLA-DQB1	0.06	0.07	0.11	0.04	0.03	0.15	0.07	
0.18277778	RelA	0.08	0.09	0.14	0.08	0.09	0.25	0.08	
0.18222222	EGF	0.14	0.14	0.13	0.08	0.08	0.23	0.1	
0.18166667	PSCD2 v1	0.09	0.11	0.1	0.12	0.25	0.24	0.19	
0.18166667	PSCD2 v2	0.09	0.11	0.1	0.12	0.25	0.24	0.19	
0.18166667	NFKBIE	0.15	0.14	0.2	0.11	0.15	0.18	0.16	
0.18055556	NRG1 vGGF	0.18	0.19	0.27	0.12	0.09	0.23	0.15	
0.18055556	NRG1 vHRG-beta3	0.18	0.19	0.27	0.12	0.09	0.23	0.15	
0.18	BSG	0.2	0.15	0.24	0.14	0.17	0.21	0.19	
0.18	TNFRSF14	0.14	0.14	0.24	0.17	0.15	0.22	0.29	
0.17882353	CASP10 v1	0.13	0.14	0.29	0.13	0.15	0.24	0.12	
0.17882353	CASP10 vC	0.13	0.14	0.29	0.13	0.15	0.24	0.12	
0.17882353	CASP10 vD	0.13	0.14	0.29	0.13	0.15	0.24	0.12	
0.17777778	IL2	0.23	0.14	0.13	0.07	0.07	0.34	0.1	
0.1775	AVPR1A	0.17	0.18	0.14	0.12	0.16	0.27	0.14	
0.1775	CYT19	0.17	0.17	0.13	0.18		0.17	0.14	
0.17722222	TNFRSF17	0.1	0.09	0.21	0.09	0.1	0.2	0.13	
0.17058824	GRM4	0.16	0.13	0.14	0.05	0.08	0.22		
0.176875	GNRHR	0.19	0.16	0.12	0.21	0.18	0.18	0.14	
0.17611111	CNIH	0.16	0.15	0.18	0.32	0.21	0.2	0.13	
0.17588235	CYP3A43 v1	0.11	0.14	0.25	0.15	0.21		0.2	
0.17588235	CYP3A43 v2	0.11	0.14	0.25	0.15	0.21		0.2	
0.17588235	CYP3A43 v3	0.11	0.14	0.25	0.15	0.21		0.2	
0.175	TLR8 v1	0.21	0.41	0.18	0.13	0.11	0.19	0.19	

FIG.11-36A



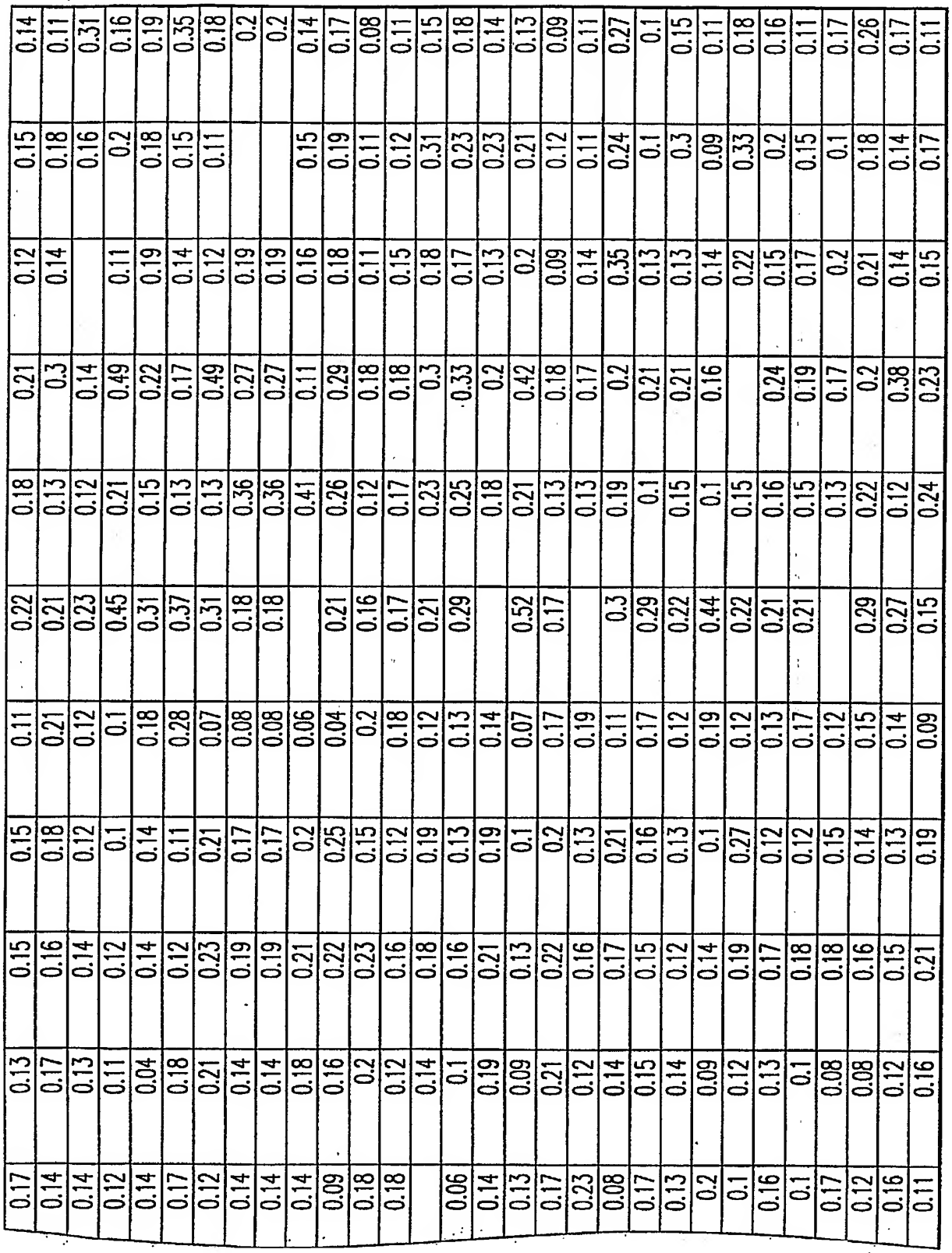
0.12	0.14	0.34	0.19	0.1		0.32			0.23	0.25		0.17	
0.1	0.09	0.08	0.1	0.25		0.25	0.22		0.31	0.28		0.17	
0.11	0.16	0.21	0.21	0.07	0.27	0.26	0.29			0.18		0.26	
0.14	0.22	0.29	0.24	0.12	0.21	0.28	0.31		0.34	0.18		0.2	
0.12	0.11	0.18	0.15	0.09	0.26	0.22	0.42		0.25	0.2		0.18	
0.06	0.07	0.13	0.07	0.05	0.25	0.36	0.32		0.39	0.68		0.38	
0.08	0.09	0.14	0.11	0.06	0.39	0.28	0.58		0.29	0.3		0.16	
0.08	0.11	0.14	0.16	0.06	0.27	0.33	0.44		0.34	0.23		0.22	
0.1	0.14	0.18	0.16	0.15	0.34	0.21	0.35		0.14	0.27		0.13	
0.1	0.14	0.18	0.16	0.15	0.34	0.21	0.35		0.14	0.27		0.13	
0.17	0.14	0.15	0.15	0.13	0.3	0.19	0.32		0.24	0.15		0.24	
0.21	0.16	0.16	0.13	0.16	0.38	0.17	0.16		0.2	0.13		0.16	
0.21	0.16	0.16	0.13	0.16	0.38	0.17	0.16		0.2	0.13		0.16	
0.2	0.15	0.18	0.14	0.21		0.18	0.22		0.14	0.22		0.12	
0.21	0.12	0.17	0.16	0.19	0.23	0.14	0.27		0.12	0.17		0.11	
0.15	0.11	0.14	0.15	0.13		0.23	0.37		0.25	0.17		0.14	
0.15	0.11	0.14	0.15	0.13		0.23	0.37		0.25	0.17		0.14	
0.15	0.11	0.14	0.15	0.13		0.23	0.37		0.25	0.17		0.14	
0.09	0.17	0.19	0.15	0.06	0.26	0.26	0.38		0.2	0.2		0.16	
0.17	0.23	0.14		0.12	0.21	0.16	0.28		0.18			0.17	
0.14	0.13	0.2	0.12	0.19	0.31		0.31		0.14	0.23		0.11	
0.1	0.08	0.1	0.11	0.08	0.31	0.27	0.46		0.26	0.28		0.22	
0.2	0.13	0.24	0.17	0.11	0.22	0.21	0.27		0.2	0.22		0.26	
0.1	0.22	0.21	0.2	0.07	0.27				0.2	0.18		0.2	
0.14	0.15	0.2	0.14	0.18	0.29	0.16	0.18		0.1	0.17		0.11	
0.24	0.11	0.16	0.1	0.19	0.27	0.15	0.27		0.18	0.12		0.14	
0.24	0.11	0.16	0.1	0.19	0.27	0.15	0.27		0.18	0.12		0.14	
0.24	0.11	0.16	0.1	0.19	0.27	0.15	0.27		0.18	0.12		0.14	
0.17	0.13	0.15	0.15	0.11	0.22	0.18	0.21		0.12	0.15		0.14	

FIG.11-36B



0.175	TLR8 v2	0.21	0.41	0.18	0.13	0.11	0.19	0.19	
0.174444444	REA	0.19	0.19	0.2	0.11	0.1	0.27	0.15	
0.174117647	ADM	0.18	0.17	0.21	0.23	0.16	0.22	0.18	
0.173888889	TNFRSF7	0.12	0.17	0.16	0.1	0.08	0.2	0.13	
0.173333333	TYK2	0.16	0.13	0.24	0.16	0.16	0.21	0.18	
0.172777778	EREG	0.11	0.13	0.09	0.13	0.13	0.2	0.15	
0.172777778	PTGES	0.14	0.18	0.12	0.08	0.13	0.14	0.14	
0.172352941	CASP9 vA	0.15	0.16	0.1	0.07	0.1	0.2	0.23	
0.172352941	CASP9 vB	0.15	0.16	0.1	0.07	0.1	0.2	0.23	
0.172352941	HSPA5	0.1	0.12	0.13	0.15	0.18	0.22	0.27	
0.172222222	GRIA3 vFlip	0.16	0.13	0.18	0.09	0.12	0.22	0.14	
0.172222222	PTPN4	0.22	0.21	0.19	0.12	0.1	0.39	0.15	
0.172222222	MMP8	0.15	0.16	0.26	0.22	0.21	0.26	0.18	
0.171764706	HTR2B	0.12	0.16	0.12	0.1	0.09	0.18	0.14	
0.171666667	FKBP6	0.21	0.17	0.12	0.08	0.08	0.21	0.19	
0.171176471	LNPEP	0.17	0.19	0.11	0.13	0.18	0.21	0.17	
0.170555556	TRHDE	0.13	0.14	0.15	0.05	0.05	0.2	0.14	
0.170555556	EBAG9	0.19	0.21	0.14	0.13	0.18	0.32	0.15	
0.17	C5	0.16	0.18	0.28	0.18	0.19	0.22	0.19	
0.169444444	TRO v2	0.12	0.13	0.14	0.05	0.07	0.18	0.1	
0.169444444	MS4A7	0.16	0.21	0.26	0.17	0.11	0.24	0.17	
0.169444444	PLAB	0.16	0.15	0.32	0.11	0.1	0.24	0.17	
0.168888889	FCGR2B	0.13	0.18	0.31	0.1	0.1	0.28	0.18	
0.168823529	SYP	0.11	0.18	0.14	0.11	0.1	0.22	0.11	
0.168333333	GPR17	0.16	0.17	0.17	0.19	0.12	0.2	0.19	
0.168235294	HSPC228	0.09		0.17	0.44	0.19	0.19	0.13	
0.167058824	OTTT022	0.16	0.19	0.24	0.14	0.21	0.3	0.13	
0.166666667	IRS2	0.11	0.14	0.17	0.12	0.14	0.19	0.12	
0.166111111	AHR	0.13	0.13	0.26	0.1	0.09	0.18	0.18	
0.165555556	CYP26A1 v1	0.14	0.18	0.17	0.11	0.14	0.3	0.13	

FIG.11-37A



0.17	0.13	0.15	0.15	0.11	0.22	0.18	0.21	0.12	0.15	0.14			
0.14	0.17	0.16	0.18	0.21	0.21	0.13	0.3	0.14	0.18	0.11			
0.14	0.13	0.14	0.12	0.12	0.23	0.12	0.14		0.16	0.31			
0.12	0.11	0.12	0.1	0.1	0.45	0.21	0.49	0.11	0.2	0.16			
0.14	0.04	0.14	0.14	0.18	0.31	0.15	0.22	0.19	0.18	0.19			
0.17	0.18	0.12	0.11	0.28	0.37	0.13	0.17	0.14	0.15	0.35			
0.12	0.21	0.23	0.21	0.07	0.31	0.13	0.49	0.12	0.11	0.18			
0.14	0.14	0.19	0.17	0.08	0.18	0.36	0.27	0.19		0.2			
0.14	0.14	0.19	0.17	0.08	0.18	0.36	0.27	0.19		0.2			
0.14	0.18	0.21	0.2	0.06		0.41	0.11	0.16	0.15	0.14			
0.09	0.16	0.22	0.25	0.04	0.21	0.26	0.29	0.18	0.19	0.17			
0.18	0.2	0.23	0.15	0.2	0.16	0.12	0.18	0.11	0.11	0.08			
0.18	0.12	0.16	0.12	0.18	0.17	0.17	0.18	0.15	0.12	0.11			
	0.14	0.18	0.19	0.12	0.21	0.23	0.3	0.18	0.31	0.15			
0.06	0.1	0.16	0.13	0.13	0.29	0.25	0.33	0.17	0.23	0.18			
0.14	0.19	0.21	0.19	0.14		0.18	0.2	0.13	0.23	0.14			
0.13	0.09	0.13	0.1	0.07	0.52	0.21	0.42	0.2	0.21	0.13			
0.17	0.21	0.22	0.2	0.17	0.17	0.13	0.18	0.09	0.12	0.09			
0.23	0.12	0.16	0.13	0.19		0.13	0.17	0.14	0.11	0.11			
0.08	0.14	0.17	0.21	0.11	0.3	0.19	0.2	0.35	0.24	0.27			
0.17	0.15	0.15	0.16	0.17	0.29	0.1	0.21	0.13	0.1	0.1			
0.13	0.14	0.12	0.13	0.12	0.22	0.15	0.21	0.13	0.3	0.15			
0.2	0.09	0.14	0.1	0.19	0.44	0.1	0.16	0.14	0.09	0.11			
0.1	0.12	0.19	0.27	0.12	0.22	0.15		0.22	0.33	0.18			
0.16	0.13	0.17	0.12	0.13	0.21	0.16	0.24	0.15	0.2	0.16			
0.1	0.1	0.18	0.12	0.17	0.21	0.15	0.19	0.17	0.15	0.11			
0.17	0.08	0.18	0.15	0.12		0.13	0.17	0.2	0.1	0.17			
0.12	0.08	0.16	0.14	0.15	0.29	0.22	0.2	0.21	0.18	0.26			
0.16	0.12	0.15	0.13	0.14	0.27	0.12	0.38	0.14	0.14	0.17			
0.11	0.16	0.21	0.19	0.09	0.15	0.24	0.23	0.15	0.17	0.11			

FIG.11-37B

0.165555556	CYP26A1 v2	0.14	0.18	0.17	0.11	0.14	0.3	0.13	
0.165294118	HAL	0.11	0.12		0.06	0.1	0.18	0.11	
0.163888889	STXBP1	0.13	0.15	0.27	0.18	0.14	0.22	0.1	
0.163333333	WSB1 v1	0.1	0.13	0.14	0.14	0.18	0.15	0.26	
0.163333333	WSB1 v2	0.1	0.13	0.14	0.14	0.18	0.15	0.26	
0.162941176	ITK	0.18	0.16	0.17	0.16	0.19	0.25	0.13	
0.161764706	CCRL1	0.14	0.14	0.15	0.21	0.21	0.19	0.15	
0.161111111	CYP27A1	0.17	0.16	0.12	0.09	0.13	0.18	0.18	
0.160625	NCOA4	0.1	0.13	0.11	0.05	0.09	0.2	0.28	
0.160588235	SNT-1	0.19	0.19	0.19	0.11	0.17	0.22	0.22	
0.160555556	IL22R	0.1	0.12	0.17	0.07	0.08	0.28	0.12	
0.160555556	ATRN v1	0.12	0.16	0.18	0.14	0.12	0.19	0.16	
0.160555556	ATRN v2	0.12	0.16	0.18	0.14	0.12	0.19	0.16	
0.160555556	ATRN v3	0.12	0.16	0.18	0.14	0.12	0.19	0.16	
0.16	SCN5A	0.22	0.12	0.17	0.08	0.08	0.23		
0.16	SLC18A1	0.13	0.12	0.17	0.1	0.1	0.21	0.12	
0.159411765	PRKCE	0.08	0.12	0.13	0.04	0.08	0.2	0.11	
0.158823529	ANXA1	0.14	0.13	0.62	0.11		0.19	0.16	
0.158235294	SP110 vB	0.11	0.15	0.18	0.19	0.14	0.17	0.13	
0.157777778	NCOA6	0.14	0.13	0.17	0.11	0.1	0.2	0.18	
0.157647059	ICOS	0.08	0.09	0.11	0.06	0.07	0.22	0.11	
0.157222222	DBH	0.08	0.08	0.12	0.09	0.07	0.18	0.08	
0.157058824	ST13	0.13	0.12		0.13	0.11	0.19	0.2	
0.156875	SLC25A5	0.09	0.18	0.16	0.1	0.09	0.24	0.15	
0.156666667	DRD1	0.14	0.16	0.28	0.11	0.11	0.22	0.11	
0.156666667	IL2RA	0.09	0.09	0.11	0.08	0.11	0.2	0.06	
0.155882353	MC2R	0.14	0.1	0.09	0.04	0.08	0.22	0.1	
0.155555556	AIM2	0.15	0.09	0.18	0.09	0.09	0.21	0.13	
0.155555556	CCL17	0.15	0.16	0.13	0.23	0.21	0.2	0.22	
0.155555556	GABRB3 v2	0.17	0.13	0.19	0.08	0.06	0.24	0.28	

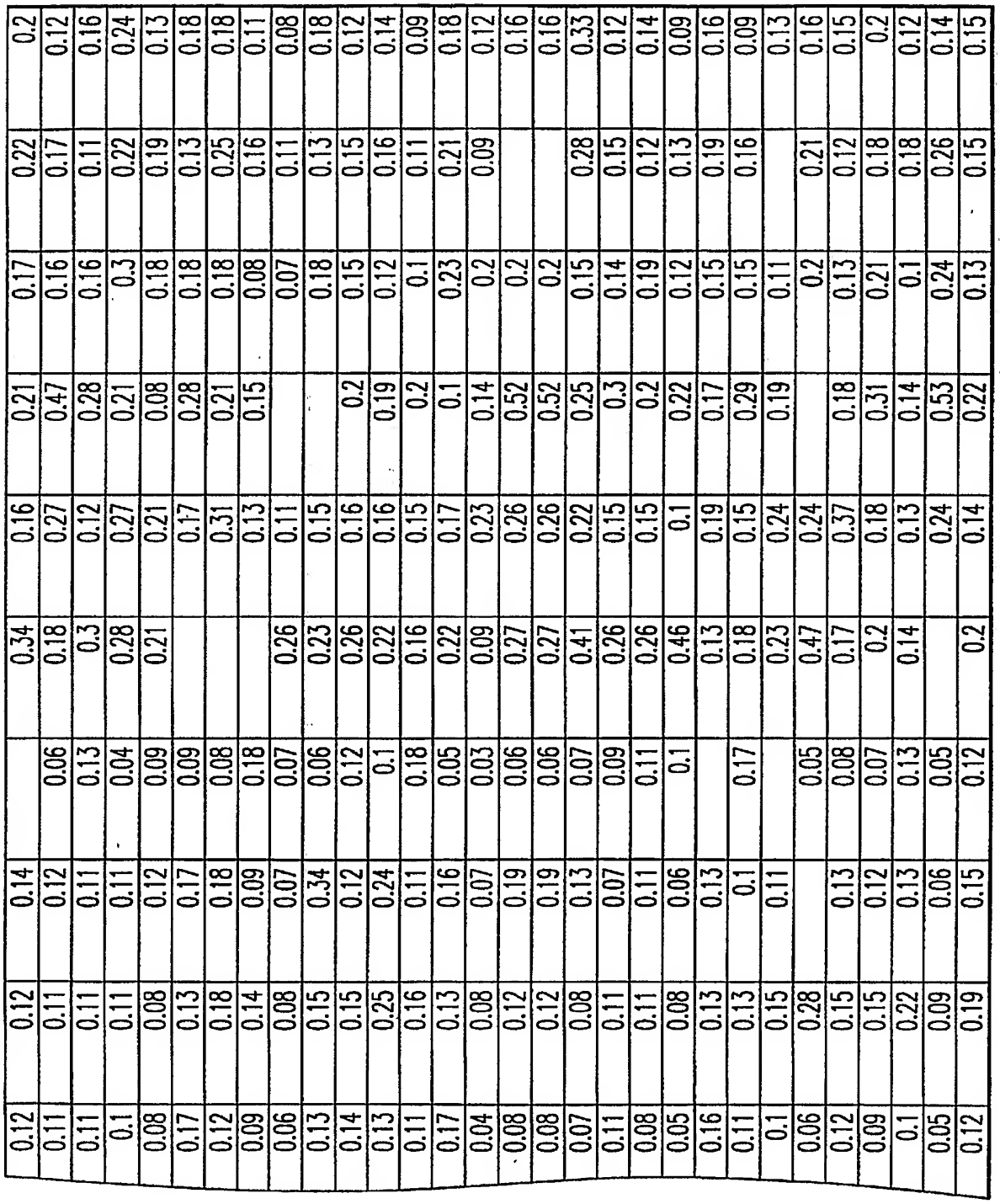
FIG.11-38A

0.11	0.16	0.21	0.19	0.09	0.15	0.24	0.23	0.15	0.17	0.11	
0.1	0.12	0.14	0.12	0.07	0.34	0.21	0.5	0.22	0.18	0.13	
0.11	0.13	0.14	0.17	0.13	0.23	0.14	0.29	0.14	0.19	0.09	
0.16	0.22	0.1	0.22	0.39	0.15	0.1	0.15	0.09	0.15	0.11	
0.16	0.22	0.1	0.22	0.39	0.15	0.1	0.15	0.09	0.15	0.11	
0.15	0.16	0.23	0.18	0.23	0.13	0.12		0.2	0.07	0.06	
0.11	0.18	0.17	0.16	0.1		0.14	0.43	0.09	0.1	0.08	
0.13	0.23	0.18	0.16	0.12	0.23	0.17	0.29	0.12	0.11	0.13	
0.15	0.07	0.07	0.13	0.12		0.23	0.23		0.39	0.22	
0.2	0.14	0.17	0.15	0.18		0.14	0.19	0.08	0.12	0.07	
0.07	0.1	0.12	0.37	0.08	0.26	0.15	0.19	0.18	0.17	0.26	
0.12	0.14	0.2	0.15	0.1	0.21	0.15	0.2	0.17	0.21	0.17	
0.12	0.14	0.2	0.15	0.1	0.21	0.15	0.2	0.17	0.21	0.17	
0.12	0.14	0.2	0.15	0.1	0.21	0.15	0.2	0.17	0.21	0.17	
	0.18	0.15	0.13		0.3		0.15	0.12	0.14	0.17	
0.15	0.09	0.11	0.1	0.12	0.34	0.15	0.28	0.18	0.24	0.17	
0.08	0.06	0.11		0.06	0.27	0.24	0.54	0.23	0.23	0.13	
0.13	0.08	0.13	0.08	0.13	0.18	0.12	0.16	0.11	0.11	0.12	
0.1	0.04	0.17	0.07	0.15	0.39	0.15	0.2	0.19		0.16	
0.19	0.12	0.13	0.14	0.17	0.29	0.15	0.24	0.12	0.13	0.13	
0.06	0.12	0.09	0.76	0.05	0.21	0.19	0.12	0.16		0.18	
0.08	0.07	0.09	0.11	0.07	0.27	0.28	0.48	0.25	0.27	0.16	
0.21	0.1	0.11	0.14	0.2	0.16	0.16	0.26	0.14	0.19	0.12	
0.17	0.07	0.13	0.1		0.22	0.17	0.28	0.21		0.15	
0.1	0.11	0.18	0.14	0.08	0.28	0.14	0.21	0.16	0.15	0.14	
0.07	0.07	0.12	0.08	0.11	0.48	0.2	0.22	0.34	0.17	0.22	
0.08	0.17	0.47	0.15	0.06	0.3	0.19		0.13	0.15	0.18	
0.16	0.16	0.14	0.13	0.14	0.27	0.19	0.11	0.18	0.22	0.16	
0.27	0.14	0.15	0.15	0.2	0.08	0.11	0.14	0.09	0.09	0.08	
0.24	0.13	0.18	0.13	0.21	0.18	0.1	0.19	0.1	0.11	0.08	

FIG.11-38B

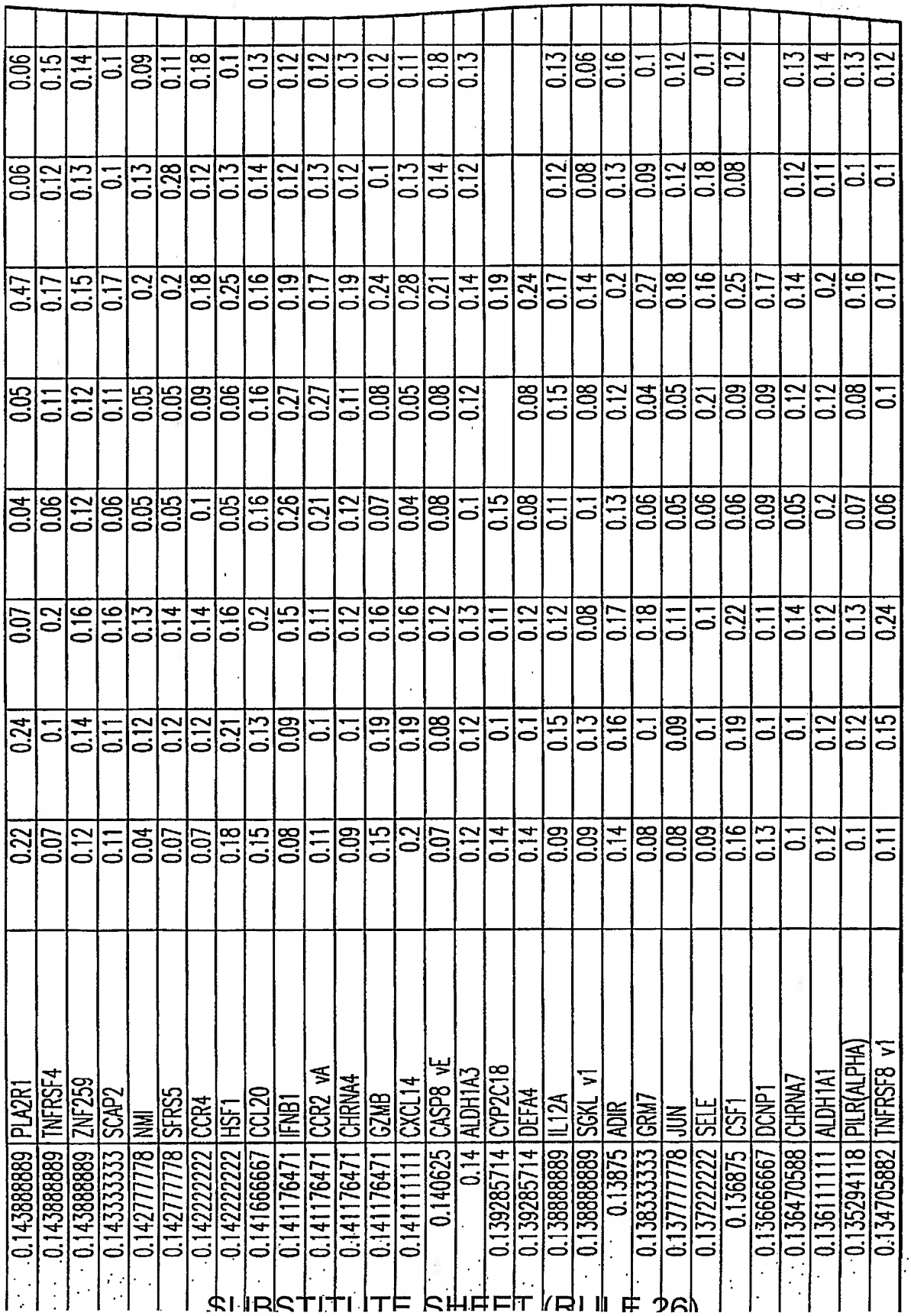
0.153333333	TNFRSF11A	0.12	0.11	0.12	0.08	0.04	0.18			
0.153333333	CCR7	0.11	0.24	0.13	0.05	0.06	0.18	0.12	0.1	
0.153333333	CYP7B1	0.13	0.14	0.24	0.09	0.12	0.2	0.11	0.14	
0.152777778	CD1D	0.13	0.13	0.12	0.03	0.05	0.18	0.1	0.13	
0.151764706	HSPA9B	0.09	0.08	0.12	0.09	0.47	0.16	0.2		
0.151764706	TGFB2	0.18	0.19	0.1	0.05	0.05	0.33	0.1	0.08	
0.15117647	STAT6	0.14	0.14	0.11	0.03	0.05	0.23	0.07	0.11	
0.15117647	IL4	0.14	0.12	0.12	0.28	0.23	0.22	0.15	0.18	
0.15117647	TBX19	0.08	0.08	0.12	0.09	0.08	0.15	0.32	0.74	
0.150588235	ASIP	0.22	0.19	0.09	0.03	0.09	0.22	0.08	0.09	
0.150555556	CYP3A5	0.11	0.12	0.18	0.15	0.17	0.16	0.13	0.12	
0.150555556	MAP3K8	0.1	0.15	0.13	0.11	0.12	0.21	0.07	0.11	
0.150555556	MBP	0.11	0.13	0.2	0.14	0.14	0.19	0.23	0.2	
0.15	CREBBP	0.11	0.16	0.19	0.07	0.07	0.22	0.11		
0.15	CYP1B1	0.07	0.08	0.12	0.03	0.98	0.19	0.07	0.07	
0.15	DPP8 v1	0.08	0.1	0.11	0.04	0.03	0.18	0.08	0.07	
0.15	DPP8 v2	0.08	0.1	0.11	0.04	0.03	0.18	0.08	0.07	
0.15	SCGB1A1	0.04	0.08		0.04	0.03		0.1	0.12	
0.149444444	SNAP29	0.24	0.2	0.14	0.1	0.07	0.19	0.13	0.12	
0.148333333	CTSC v1	0.15	0.15	0.19	0.08	0.08	0.28	0.13	0.14	
0.147777778	ANXA2	0.1	0.14	0.2	0.18	0.21	0.22	0.1	0.1	
0.147058824	CHRNA1	0.09	0.2	0.11	0.09	0.04	0.18	0.28	0.1	
0.147058824	MYC	0.13	0.12	0.14	0.18	0.11	0.17		0.12	
0.146428571	EAT2	0.14	0.12	0.08	0.15	0.16	0.14			
0.14625	CYP7A1	0.07	0.09	0.11	0.04	0.04	0.16	0.07	0.09	
0.146111111	IL17BR	0.11	0.12	0.12	0.1	0.15	0.21	0.12	0.1	
0.145555556	HCRTR1	0.15	0.13	0.2	0.03	0.05	0.18	0.11	0.06	
0.144705882	MEF2C	0.11	0.15	0.19	0.08		0.25	0.16	0.13	
0.144666667	CXCL13	0.06		0.1		0.03	0.16	0.08	0.08	
0.144444444	DUSP14	0.11	0.14	0.12	0.09	0.09	0.18	0.16	0.14	

FIG.11-39A



0.12	0.12	0.14		0.34	0.16	0.21	0.17	0.22	0.2
0.11	0.11	0.12	0.06	0.18	0.27	0.47	0.16	0.17	0.12
0.11	0.11	0.11	0.13	0.3	0.12	0.28	0.16	0.11	0.16
0.1	0.11	0.11	0.04	0.28	0.27	0.21	0.3	0.22	0.24
0.08	0.08	0.12	0.09	0.21	0.21	0.08	0.18	0.19	0.13
0.17	0.13	0.17	0.09		0.17	0.28	0.18	0.13	0.18
0.12	0.18	0.18	0.08		0.31	0.21	0.18	0.25	0.18
0.09	0.14	0.09	0.18		0.13	0.15	0.08	0.16	0.11
0.06	0.08	0.07	0.07	0.26	0.11		0.07	0.11	0.08
0.13	0.15	0.34	0.06	0.23	0.15		0.18	0.13	0.18
0.14	0.15	0.12	0.12	0.26	0.16	0.2	0.15	0.15	0.12
0.13	0.25	0.24	0.1	0.22	0.16	0.19	0.12	0.16	0.14
0.11	0.16	0.11	0.18	0.16	0.15	0.2	0.1	0.11	0.09
0.17	0.13	0.16	0.05	0.22	0.17	0.1	0.23	0.21	0.18
0.04	0.08	0.07	0.03	0.09	0.23	0.14	0.2	0.09	0.12
0.08	0.12	0.19	0.06	0.27	0.26	0.52	0.2		0.16
0.08	0.12	0.19	0.06	0.27	0.26	0.52	0.2		0.16
0.07	0.08	0.13	0.07	0.41	0.22	0.25	0.15	0.28	0.33
0.11	0.11	0.07	0.09	0.26	0.15	0.3	0.14	0.15	0.12
0.08	0.11	0.11	0.11	0.26	0.15	0.2	0.19	0.12	0.14
0.05	0.08	0.06	0.1	0.46	0.1	0.22	0.12	0.13	0.09
0.16	0.13	0.13		0.13	0.19	0.17	0.15	0.19	0.16
0.11	0.13	0.1	0.17	0.18	0.15	0.29	0.15	0.16	0.09
0.1	0.15	0.11		0.23	0.24	0.19	0.11		0.13
0.06	0.28		0.05	0.47	0.24		0.2	0.21	0.16
0.12	0.15	0.13	0.08	0.17	0.37	0.18	0.13	0.12	0.15
0.09	0.15	0.12	0.07	0.2	0.18	0.31	0.21	0.18	0.2
0.1	0.22	0.13	0.13	0.14	0.13	0.14	0.1	0.18	0.12
0.05	0.09	0.06	0.05		0.24	0.53	0.24	0.26	0.14
0.12	0.19	0.15	0.12	0.2	0.14	0.22	0.13	0.15	0.15

FIG.11-39B



0.143888889	PLA2R1	0.22	0.24	0.07	0.04	0.05	0.47	0.06	0.06	
0.143888889	TNFRSF4	0.07	0.1	0.2	0.06	0.11	0.17	0.12	0.15	
0.143888889	ZNF259	0.12	0.14	0.16	0.12	0.12	0.15	0.13	0.14	
0.143333333	SCAP2	0.11	0.11	0.16	0.06	0.11	0.17	0.1	0.1	
0.142777778	NMI	0.04	0.12	0.13	0.05	0.05	0.2	0.13	0.09	
0.142777778	SFRS5	0.07	0.12	0.14	0.05	0.05	0.2	0.28	0.11	
0.142222222	CCR4	0.07	0.12	0.14	0.1	0.09	0.18	0.12	0.18	
0.142222222	HSF1	0.18	0.21	0.16	0.05	0.06	0.25	0.13	0.1	
0.141666667	CCL20	0.15	0.13	0.2	0.16	0.16	0.16	0.14	0.13	
0.14117647	IFNB1	0.08	0.09	0.15	0.26	0.27	0.19	0.12	0.12	
0.141176471	CCR2 vA	0.11	0.1	0.11	0.21	0.27	0.17	0.13	0.12	
0.141176471	CHRNA4	0.09	0.1	0.12	0.12	0.11	0.19	0.12	0.13	
0.14117647	GZMB	0.15	0.19	0.16	0.07	0.08	0.24	0.1	0.12	
0.141111111	CXCL14	0.2	0.19	0.16	0.04	0.05	0.28	0.13	0.11	
0.140625	CASP8 vE	0.07	0.08	0.12	0.08	0.08	0.21	0.14	0.18	
0.14	ALDH1A3	0.12	0.12	0.13	0.1	0.12	0.14	0.12	0.13	
0.139285714	CYP2C18	0.14	0.1	0.11	0.15		0.19			
0.139285714	DEFA4	0.14	0.1	0.12	0.08	0.08	0.24			
0.138888889	IL12A	0.09	0.15	0.12	0.11	0.15	0.17	0.12	0.13	
0.138888889	SGKL v1	0.09	0.13	0.08	0.1	0.08	0.14	0.08	0.06	
0.13875	ADIR	0.14	0.16	0.17	0.13	0.12	0.2	0.13	0.16	
0.138333333	GRM7	0.08	0.1	0.18	0.06	0.04	0.27	0.09	0.1	
0.137777778	JUN	0.08	0.09	0.11	0.05	0.05	0.18	0.12	0.12	
0.137222222	SELE	0.09	0.1	0.1	0.06	0.21	0.16	0.18	0.1	
0.136875	CSF1	0.16	0.19	0.22	0.06	0.09	0.25	0.08	0.12	
0.136666667	DCNP1	0.13	0.1	0.11	0.09	0.09	0.17			
0.136470588	CHRNA7	0.1	0.1	0.14	0.05	0.12	0.14	0.12	0.13	
0.136111111	ALDH1A1	0.12	0.12	0.12	0.2	0.12	0.2	0.11	0.14	
0.135294118	PILR(ALPHA)	0.1	0.12	0.13	0.07	0.08	0.16	0.1	0.13	
0.134705882	TNFRSF8 v1	0.11	0.15	0.24	0.06	0.1	0.17	0.1	0.12	

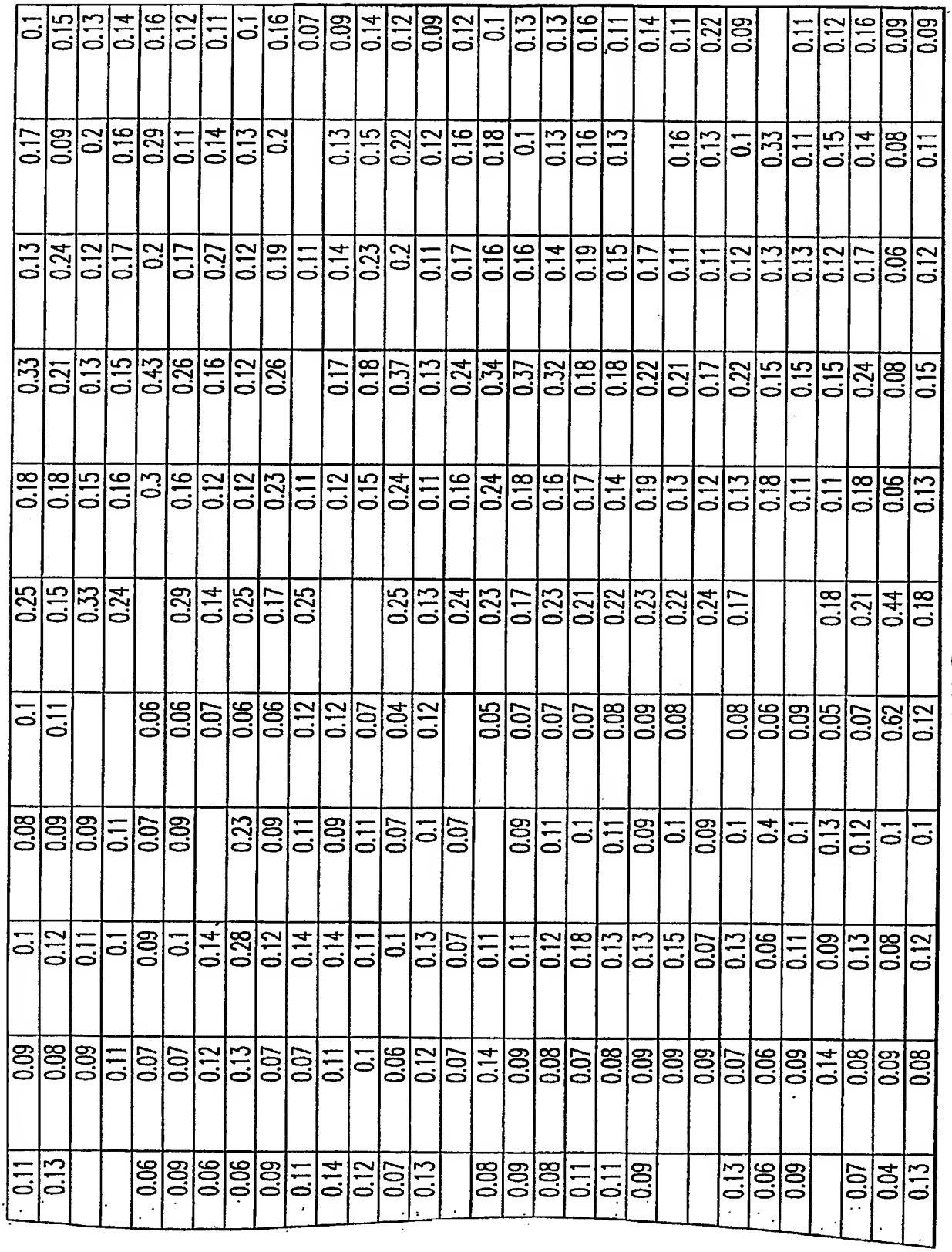
FIG.11-40A

0.38	0.08	0.13	0.06	0.18	0.09	0.18	0.09	0.1	0.09
0.08	0.11	0.37	0.08	0.26	0.15	0.24	0.12	0.11	0.09
0.13	0.14	0.12	0.17	0.19	0.16	0.21	0.11	0.16	0.12
0.09	0.11	0.09	0.1	0.45	0.13	0.24	0.1	0.23	0.12
0.09	0.08	0.11	0.11	0.38	0.2	0.19	0.18	0.26	0.16
0.09	0.1	0.15	0.09	0.23	0.18	0.2	0.2	0.13	0.18
0.2	0.12	0.13	0.1	0.21	0.12	0.16	0.18	0.19	0.15
0.14	0.16	0.12	0.08	0.21	0.12	0.19	0.17	0.11	0.12
0.16	0.15	0.11	0.23	0.13	0.1	0.15	0.1	0.11	0.08
0.09	0.13	0.08	0.15	0.13	0.12	0.19	0.13		0.1
0.1	0.15	0.12	0.14	0.21	0.17		0.09	0.11	0.09
0.08	0.14	0.36	0.1	0.13		0.26	0.13	0.12	0.1
0.12	0.14	0.13	0.08		0.17	0.25	0.14	0.15	0.11
0.08	0.12	0.12	0.07	0.18	0.24	0.22	0.13	0.12	0.1
0.07	0.11	0.12		0.27	0.19	0.18	0.19		0.16
0.09	0.12	0.1	0.13	0.22	0.21		0.17	0.22	0.14
0.11	0.14	0.1		0.25	0.14	0.13	0.1	0.18	0.11
0.08	0.1	0.09		0.31		0.17	0.12	0.18	0.14
0.1	0.15	0.15	0.1	0.29	0.14	0.17	0.12	0.12	0.12
0.18	0.16	0.12	0.06	0.22	0.28	0.22	0.14	0.21	0.15
0.11	0.14	0.1	0.14	0.15	0.14		0.13		0.1
0.07	0.13	0.07	0.06	0.21	0.19	0.35	0.17	0.21	0.11
0.07	0.12	0.08	0.09	0.3	0.18	0.26	0.28	0.14	0.16
0.07	0.11	0.11	0.19	0.25	0.19	0.18	0.15	0.1	0.12
0.14	0.12	0.16	0.12		0.1		0.16	0.11	0.11
0.11	0.15	0.09		0.25	0.16	0.15	0.14	0.18	0.13
	0.16	0.15	0.08	0.18	0.17	0.21	0.12	0.13	0.22
0.09	0.13	0.1	0.14	0.2	0.16	0.15	0.13	0.11	0.11
0.13	0.15	0.09	0.08	0.24	0.17		0.18	0.21	0.16
0.07	0.1	0.1	0.1		0.25	0.28	0.1	0.11	0.13

FIG.11-40B

0.13444444	KLRB1	0.11	0.14	0.1	0.07	0.06	0.18	0.12
0.13444444	TNFSF18	0.11	0.12	0.11	0.11	0.1	0.17	0.15
0.134	MMP1	0.15	0.1	0.12	0.05	0.05	0.19	
0.134	TNFRSF10C	0.14	0.09	0.1	0.08	0.08	0.18	
0.13529412	IFNA8	0.07	0.1	0.08	0.03	0.03	0.17	0.06
0.133333333	CYP21A2	0.12	0.13	0.2	0.07	0.1	0.18	0.08
0.1325	LCK	0.13	0.15	0.1	0.09	0.08	0.24	
0.13222222	CXCL10	0.06	0.08	0.09	0.14	0.15	0.17	0.09
0.13111111	PACE4	0.1	0.1	0.11	0.04	0.05	0.2	0.12
0.130625	GRM2	0.12	0.13	0.22	0.11	0.08	0.22	0.12
0.13	IL13RA1	0.14	0.15	0.15	0.13	0.09	0.2	0.1
0.13	IL9	0.13	0.13	0.17	0.06	0.08	0.2	0.08
0.129444444	CYSLTR1	0.08	0.08	0.13	0.04	0.03	0.16	0.07
0.129444444	NP	0.16	0.11	0.14	0.12	0.13	0.19	0.19
0.129333333	GFRA2	0.11	0.07	0.07	0.09	0.12	0.18	
0.128235294	AR	0.07	0.07	0.11	0.04	0.04	0.14	0.08
0.127777778	KIT	0.09	0.11	0.11	0.07	0.07	0.19	0.1
0.127777778	CD4	0.1	0.15	0.1	0.06	0.07	0.17	0.08
0.127222222	DAP	0.11	0.1	0.15	0.04	0.04	0.17	0.08
0.127222222	LHCGR	0.09	0.13	0.14	0.08	0.08	0.24	0.09
0.125882353	IRF6	0.1	0.13	0.11	0.05	0.05	0.17	0.09
0.125882353	TNFSF8	0.1	0.14	0.12	0.06	0.07	0.18	0.11
0.124666667	TAC3	0.14	0.08	0.14	0.04	0.05	0.18	
0.12444444	EPS15R	0.11	0.13	0.19	0.1	0.1	0.16	0.11
0.124375	NCOA5	0.04	0.07	0.11	0.03	0.04	0.17	0.1
0.124117647	CACNB4	0.1	0.11	0.2	0.16	0.14	0.19	0.12
0.122941176	ALDH4A1	0.07	0.15	0.14	0.12	0.09	0.2	0.08
0.122777778	AANAT	0.08	0.12	0.11	0.03	0.06	0.17	0.07
0.122777778	CDV-1	0.04	0.07	0.06	0.04	0.04	0.15	0.07
0.121666667	TBX21	0.09	0.11	0.16	0.08	0.11	0.2	0.11

FIG.11-41A



0.11	0.09	0.1	0.08	0.1	0.25	0.18	0.33	0.13	0.17	0.1		
0.13	0.08	0.12	0.09	0.11	0.15	0.18	0.21	0.24	0.09	0.15		
	0.09	0.11	0.09		0.33	0.15	0.13	0.12	0.2	0.13		
	0.11	0.1	0.11		0.24	0.16	0.15	0.17	0.16	0.14		
0.06	0.07	0.09	0.07	0.06		0.3	0.43	0.2	0.29	0.16		
0.09	0.07	0.1	0.09	0.06	0.29	0.16	0.26	0.17	0.11	0.12		
0.06	0.12	0.14		0.07	0.14	0.12	0.16	0.27	0.14	0.11		
0.06	0.13	0.28	0.23	0.06	0.25	0.12	0.12	0.12	0.13	0.1		
0.09	0.07	0.12	0.09	0.06	0.17	0.23	0.26	0.19	0.2	0.16		
0.11	0.07	0.14	0.11	0.12	0.25	0.11		0.11		0.07		
0.14	0.11	0.14	0.09	0.12		0.12	0.17	0.14	0.13	0.09		
0.12	0.1	0.11	0.11	0.07		0.15	0.18	0.23	0.15	0.14		
0.07	0.06	0.1	0.07	0.04	0.25	0.24	0.37	0.2	0.22	0.12		
0.13	0.12	0.13	0.1	0.12	0.13	0.11	0.13	0.11	0.12	0.09		
	0.07	0.07	0.07		0.24	0.16	0.24	0.17	0.16	0.12		
0.08	0.14	0.11		0.05	0.23	0.24	0.34	0.16	0.18	0.1		
0.09	0.09	0.11	0.09	0.07	0.17	0.18	0.37	0.16	0.1	0.13		
0.08	0.08	0.12	0.11	0.07	0.23	0.16	0.32	0.14	0.13	0.13		
0.11	0.07	0.18	0.1	0.07	0.21	0.17	0.18	0.19	0.16	0.16		
0.11	0.08	0.13	0.11	0.08	0.22	0.14	0.18	0.15	0.13	0.11		
0.09	0.09	0.13	0.09	0.09	0.23	0.19	0.22	0.17		0.14		
	0.09	0.15	0.1	0.08	0.22	0.13	0.21	0.11	0.16	0.11		
	0.09	0.07	0.09		0.24	0.12	0.17	0.11	0.13	0.22		
0.13	0.07	0.13	0.1	0.08	0.17	0.13	0.22	0.12	0.1	0.09		
0.06	0.06	0.06	0.4	0.06		0.18	0.15	0.13	0.33			
0.09	0.09	0.11	0.1	0.09		0.11	0.15	0.13	0.11	0.11		
	0.14	0.09	0.13	0.05	0.18	0.11	0.15	0.12	0.15	0.12		
0.07	0.08	0.13	0.12	0.07	0.21	0.18	0.24	0.17	0.14	0.16		
0.04	0.09	0.08	0.1	0.62	0.44	0.06	0.08	0.06	0.08	0.09		
0.13	0.08	0.12	0.1	0.12	0.18	0.13	0.15	0.12	0.11	0.09		

FIG.11-41B

0.12125	C8B	0.14	0.15	0.14	0.06	0.05	0.18	0.1	
0.120588235	IL13RA2	0.07	0.07	0.11	0.04	0.03	0.2	0.07	
0.120555556	DMGDH	0.11	0.1	0.14	0.07	0.06	0.19	0.11	
0.120555556	HTR1D	0.09	0.1	0.14	0.07	0.08	0.16	0.11	
0.120555556	SCP2	0.1	0.12	0.08	0.05	0.04	0.14	0.1	
0.12	IL23A	0.09	0.13	0.12	0.11	0.08	0.15	0.12	
0.119444444	GATA3	0.08	0.1	0.08	0.1	0.11	0.16	0.13	
0.119444444	DAPK1	0.09	0.16	0.17	0.08	0.07	0.17	0.11	
0.119375	NTT73	0.05	0.09	0.18	0.07	0.1	0.17	0.08	
0.118888889	INSL6	0.07	0.09	0.18	0.03	0.03	0.15	0.07	
0.118823529	GABRA4	0.1	0.19	0.09	0.06	0.08	0.18	0.11	
0.118333333	HSPE1	0.09	0.1	0.14	0.06	0.05	0.16	0.11	
0.118333333	LEC2	0.11	0.11	0.13	0.12	0.12	0.19	0.12	
0.118333333	PHIP	0.13	0.15	0.1	0.08	0.08	0.18	0.15	
0.117647059	CSF2RA v1	0.05	0.07	0.13	0.04	0.04	0.18	0.13	
0.117222222	ALDH6A1	0.11	0.1	0.08	0.12	0.13	0.19	0.11	
0.116666667	ITGA4	0.09	0.13	0.1	0.03	0.04	0.17	0.07	
0.116666667	CLU	0.07	0.08	0.14	0.1	0.07	0.17	0.13	
0.116470588	IDE	0.07	0.09	0.19	0.12	0.11	0.16	0.11	
0.116111111	GBP1	0.09	0.1	0.08	0.03	0.04	0.18	0.07	
0.115625	IL2RG	0.12	0.12	0.08		0.06	0.22	0.08	
0.115	IL1F7	0.1	0.1	0.1	0.1	-0.1	0.21	0.13	
0.114705882	MAP3K2	0.09	0.09	0.15	0.09	0.08	0.16	0.09	
0.114705882	TNFRSF6 v1	0.07	0.09	0.12	0.05	0.07	0.17	0.08	
0.114285714	TNFRSF10D	0.12	0.09	0.09	0.06	0.06			
0.114117647	PTPRK	0.11	0.16	0.08	0.05	0.09	0.2	0.07	
0.114	CYP51	0.07	0.09	0.13	0.13	0.22	0.12	0.19	
0.113888889	BTK	0.08	0.09	0.12	0.05	0.05	0.2	0.08	
0.113333333	TNFSF4	0.1	0.12	0.15	0.07	0.07	0.18	0.1	
0.112352941	MDM2 vA	0.09	0.07	0.07	0.04	0.06	0.16	0.15	

FIG.11-42A

0.1	0.14	0.18	0.12	0.1	0.14		0.18	0.1		0.06
0.07	0.05	0.11	0.07	0.04	0.3	0.26		0.22	0.22	0.12
0.1	0.09	0.13	0.11	0.09	0.18	0.14	0.18	0.14	0.12	0.11
0.12	0.08	0.13	0.1	0.11	0.19	0.12	0.21	0.15	0.13	0.08
0.07	0.08	0.1	0.07	0.06	0.34	0.16	0.22	0.17	0.15	0.12
0.13	0.09	0.19	0.1	0.09	0.17	0.1	0.15	0.11	0.12	0.11
0.11	0.08	0.09	0.12	0.1	0.15	0.14	0.19	0.12	0.18	0.11
0.08	0.09	0.14	0.13	0.09	0.15	0.12	0.18	0.1	0.14	0.08
0.07	0.09	0.11	0.1	0.09	0.21	0.16	0.16			0.18
0.07	0.08	0.1	0.1	0.03	0.22	0.13	0.36	0.14	0.18	0.11
0.09	0.1	0.13	0.09	0.08		0.11	0.2	0.13	0.15	0.13
0.13	0.1	0.09	0.07	0.09	0.21	0.14	0.27	0.12	0.12	0.08
0.1	0.09	0.13	0.1	0.1	0.16	0.11	0.15	0.09	0.1	0.1
0.15	0.09	0.13	0.09	0.09	0.13	0.1	0.19	0.09	0.12	0.08
0.13	0.08	0.07	0.13	0.1		0.15	0.19	0.13	0.25	0.13
0.11	0.09	0.1	0.08	0.07	0.34	0.11	0.12	0.09	0.1	0.06
0.11	0.06	0.09	0.1	0.04	0.28	0.18	0.24	0.13	0.12	0.12
0.08	0.07	0.12	0.09	0.07	0.25	0.16	0.19	0.12	0.11	0.08
0.1	0.06	0.16	0.08	0.1	0.21	0.13		0.09	0.11	0.09
0.06	0.05	0.09	0.08	0.04	0.27	0.17	0.2	0.2	0.14	0.2
0.07	0.11	0.14	0.19	0.05	0.19	0.13	0.1	0.09		0.1
0.1	0.1	0.11	0.19	0.08	0.15	0.09	0.15	0.1	0.1	0.06
0.14	0.07	0.11	0.08	0.1		0.15	0.16	0.12	0.17	0.1
0.1	0.05	0.12	0.09	0.07	0.22	0.19		0.18	0.18	0.1
	0.09	0.06	0.08		0.27	0.18	0.13	0.12	0.13	0.12
0.07	0.08	0.12	0.07	0.05		0.15	0.2	0.15	0.16	0.13
0.1		0.12	0.09	0.1	0.1	0.09		0.09		0.07
0.07	0.06	0.1	0.08	0.05	0.2	0.17	0.25	0.14	0.16	0.1
0.08	0.12	0.14	0.11	0.07	0.15	0.12	0.18	0.1	0.1	0.08
0.17	0.1	0.19	0.16	0.11	0.14	0.11	0.11		0.09	0.09

FIG.11-42B

0.112222222	CASP6 va	0.13	0.19	0.14	0.03	0.05	0.2	0.06	
0.112222222	CASP6 vb	0.13	0.19	0.14	0.03	0.05	0.2	0.06	
0.112222222	CDX1	0.09	0.11	0.12	0.1	0.12	0.19	0.09	
0.112222222	CYP39A1	0.11	0.1	0.17	0.08	0.07	0.18	0.11	
0.112222222	GIOT-3	0.04	0.06	0.1	0.03	0.4	0.15	0.09	
0.111666667	GPR58	0.16	0.2	0.12	0.04	0.05	0.17	0.08	
0.111666667	SCN1B	0.06	0.08	0.14	0.06	0.05	0.18	0.08	
0.111176471	NPY1R	0.1	0.12	0.1	0.04	0.08	0.27	0.05	
0.110588235	MME v1	0.06	0.08	0.09	0.05		0.19	0.09	
0.110588235	MME v1bis	0.06	0.08	0.09	0.05		0.19	0.09	
0.110588235	MME v2a	0.06	0.08	0.09	0.05		0.19	0.09	
0.110588235	MME v2b	0.06	0.08	0.09	0.05		0.19	0.09	
0.11	FY	0.09	0.12	0.12	0.06	0.08	0.19	0.09	
0.11	IFNAR1	0.1	0.08	0.11	0.04	0.04	0.16	0.09	
0.11	SLC6A5	0.1	0.11	0.13	0.06	0.08	0.18	0.09	
0.11	TNFRSF10B v1	0.07	0.08		0.02	0.03	0.17	0.08	
0.108823529	GRIA4	0.07	0.08	0.28	0.1	0.14	0.14	0.16	
0.108823529	IL7R	0.11	0.1	0.11	0.08	0.1	0.18	0.1	
0.108823529	IRS4	0.08	0.09	0.12	0.04	0.04	0.16	0.08	
0.108666667	CYP2C8 vHp1-1	0.12	0.07	0.06	0.02	0.08	0.17		
0.108666667	CYP2C8 vHp1-2	0.12	0.07	0.06	0.02	0.08	0.17		
0.108333333	TFRC	0.11	0.11	0.09	0.03	0.03	0.23	0.08	
0.108333333	HAVCR2	0.05	0.08	0.11	0.03	0.05	0.21	0.11	
0.107222222	EPHX2	0.07	0.09	0.09	0.05	0.06	0.15	0.09	
0.106875	CCL25 v2	0.12		0.13	0.06		0.14	0.13	
0.106470588	TLR3	0.07	0.08	0.08	0.09	0.08	0.15	0.09	
0.106111111	IFNGR1	0.06	0.07	0.15	0.09	0.09	0.16	0.06	
0.106111111	AIG-1	0.08	0.1	0.13	0.07	0.05	0.15	0.07	
0.105882353	GSTM3	0.07	0.08	0.13	0.06	0.05	0.21	0.15	
0.105555556	CCR6 v1	0.08	0.1	0.09	0.07	0.07	0.17	0.12	

FIG.11-43A

0.07	0.12	0.14	0.1	0.05	0.22	0.09	0.14	0.1	0.11	0.08
0.07	0.12	0.14	0.1	0.05	0.22	0.09	0.14	0.1	0.11	0.08
0.08	0.06	0.1	0.1	0.07	0.13	0.12	0.13	0.14	0.12	0.15
0.11	0.08	0.12	0.08	0.11	0.13	0.21	0.12	0.08	0.08	0.08
0.05	0.07	0.06	0.12	0.03	0.26	0.18	0.1	0.07	0.14	0.07
0.09	0.12	0.13	0.11	0.08	0.16	0.09	0.12	0.11	0.09	0.09
0.12	0.06	0.14	0.08	0.05	0.13	0.24	0.19	0.1	0.13	0.12
0.05	0.16	0.18	0.12	0.09	0.16	0.09	0.09	0.1		0.09
0.05	0.07	0.08	0.12	0.05	0.17	0.12	0.13	0.17	0.18	0.18
0.05	0.07	0.08	0.12	0.05	0.17	0.12	0.13	0.17	0.18	0.18
0.05	0.07	0.08	0.12	0.05	0.17	0.12	0.13	0.17	0.18	0.18
0.05	0.07	0.08	0.12	0.05	0.17	0.12	0.13	0.17	0.18	0.18
0.1	0.08	0.11	0.08	0.17		0.1	0.16	0.13	0.09	0.1
0.09	0.06	0.1	0.09	0.06	0.25	0.15	0.2	0.11	0.16	0.09
0.1	0.09	0.1	0.13	0.07		0.12	0.17	0.13	0.1	0.11
0.07	0.05	0.1	0.07	0.42		0.15	0.16	0.09	0.13	0.07
0.1	0.07	0.1	0.08	0.07	0.1		0.14	0.07	0.07	0.08
0.12	0.1	0.1	0.09	0.09		0.13	0.15	0.1	0.08	0.11
0.07	0.07	0.09	0.08	0.06		0.25	0.24	0.11	0.16	0.11
	0.11	0.09	0.11		0.21	0.19	0.1	0.09	0.11	0.1
	0.11	0.09	0.11		0.21	0.19	0.1	0.09	0.11	0.1
0.1	0.1	0.1	0.09	0.06	0.2	0.1	0.18	0.13	0.1	0.11
0.07	0.08	0.08	0.12	0.05	0.19	0.13	0.18	0.09	0.13	0.19
0.07	0.09	0.1	0.1	0.05	0.2	0.16	0.15	0.16	0.12	0.13
0.05	0.09	0.1	0.12	0.06	0.17	0.14	0.09	0.1	0.11	0.1
0.08	0.11	0.13		0.11	0.16	0.12	0.16	0.11	0.12	0.07
0.03	0.07	0.08	0.09	0.08	0.13	0.08	0.09	0.39	0.1	0.09
0.07	0.06	0.08	0.06	0.05	0.21	0.12	0.22	0.13	0.16	0.1
0.1	0.07	0.08		0.05	0.13	0.11	0.17	0.14	0.11	0.09
0.08	0.06	0.08	0.1	0.05	0.14	0.14	0.23	0.13	0.1	0.09

FIG.11-43B

0.105294118	HTR1E	0.11	0.12	0.08	0.07	0.07	0.18	0.06	
0.105294118	CSF2RB	0.09	0.1	0.13	0.05	0.06	0.18	0.08	
0.105	IFNA16	0.04	0.08	0.08	0.14	0.08	0.17	0.07	
0.105	IFNA21	0.04	0.08	0.08	0.14	0.08	0.17	0.07	
0.105	IFNA4	0.04	0.08	0.08	0.14	0.08	0.17	0.07	
0.104375	NPY5R	0.05	0.09	0.11	0.04	0.04	0.2	0.1	
0.102941176	IL8RB	0.14	0.1	0.16	0.04	0.07	0.21	0.09	
0.102222222	EN1	0.08	0.08	0.09	0.08	0.07	0.16	0.1	
0.101764706	CYP4F11	0.06	0.12		0.08	0.06	0.13	0.07	
0.101176471	IRAK4	0.09	0.11	0.1	0.04	0.04	0.18	0.09	
0.101176471	N-PAC	0.05	0.06	0.15	0.03	0.04	0.14	0.24	
0.101111111	NPR2 vL	0.04	0.07	0.07	0.03	0.04	0.13	0.07	
0.101111111	NPR2 vS	0.04	0.07	0.07	0.03	0.04	0.13	0.07	
0.100555556	RTN1	0.1	0.12	0.13	0.05	0.07	0.19	0.08	
0.1	JAK2	0.09	0.09	0.13	0.05	0.05	0.18	0.09	
0.1	NFATC3	0.08	0.1	0.21	0.04	0.05	0.16	0.11	
0.099444444	MTNR1B	0.06	0.06	0.08	0.12	0.1	0.11	0.13	
0.099375	TNFRSF9	0.08	0.07	0.07	0.05	0.03	0.14		
0.098666667	AKR1C3	0.05	0.07		0.07		0.27	0.12	
0.097222222	YARS	0.07	0.07	0.1	0.05	0.07	0.13	0.13	
0.096666667	CCR8	0.05	0.07	0.08	0.05	0.08	0.16	0.11	
0.096666667	TRAF2 v1	0.07	0.09	0.12	0.06	0.06	0.13	0.07	
0.096666667	TRAF2 v2	0.07	0.09	0.12	0.06	0.06	0.13	0.07	
0.09625	C6	0.09	0.08	0.08	0.07	0.08		0.07	
0.096111111	CHRNB3	0.04	0.07	0.08	0.05	0.1	0.21	0.09	
0.095555556	CD80	0.09	0.16	0.08	0.03	0.03	0.15	0.05	
0.095555556	IL7	0.07	0.12	0.09	0.04	0.05	0.15	0.12	
0.095333333	MAPK8IP1	0.07	0.1	0.13	0.05	0.08		0.09	
0.095294118	RFXAP	0.07	0.07	0.09	0.04	0.03	0.16	0.06	
0.093888889	GABRG2	0.08	0.1	0.14	0.02	0.02	0.17	0.06	

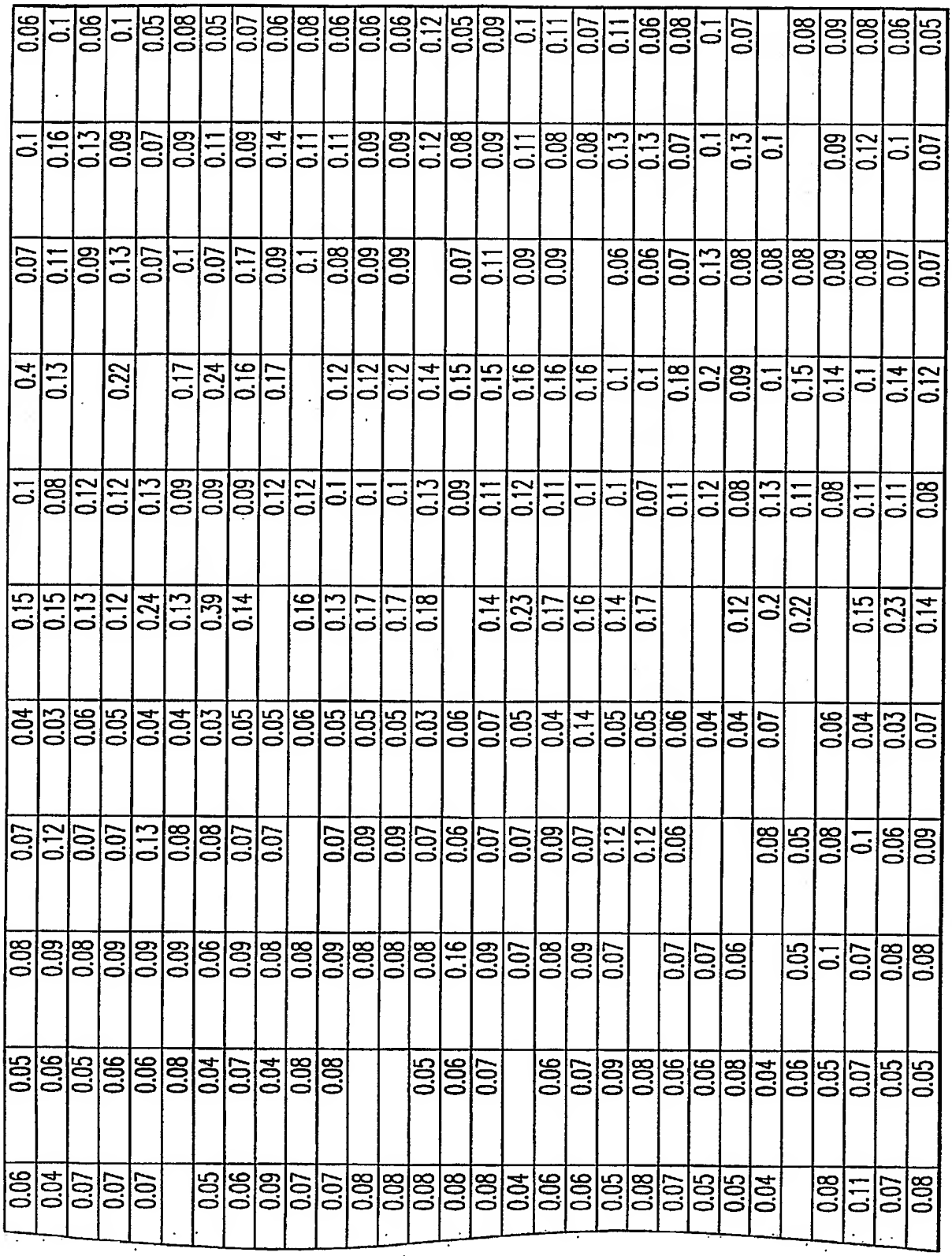
FIG.11-44A

0.09	0.11	0.15	0.11	0.06		0.12	0.17	0.09	0.1	0.1			
0.09	0.07	0.08	0.08	0.06	0.21	0.14		0.13	0.13	0.11			
0.04	0.09	0.21	0.12	0.04	0.2	0.11	0.1	0.09	0.13	0.1			
0.04	0.09	0.21	0.12	0.04	0.2	0.11	0.1	0.09	0.13	0.1			
0.04	0.09	0.21	0.12	0.04	0.2	0.11	0.1	0.09	0.13	0.1			
0.06	0.08	0.08	0.13		0.26	0.09	0.15	0.07	0.12				
0.08	0.11	0.12	0.13	0.06		0.09	0.07	0.07	0.11	0.1			
0.08	0.07	0.09	0.08	0.06	0.24	0.1	0.2	0.08	0.1	0.08			
0.08	0.08	0.12	0.09	0.06	0.15	0.12	0.19	0.1	0.14	0.08			
0.1	0.06	0.1	0.07	0.07	0.22	0.09		0.08	0.21	0.07			
0.17	0.07	0.05	0.13	0.05	0.17	0.1	0.12	0.06		0.09			
0.07	0.06	0.06	0.11	0.04	0.11	0.06	0.09	0.09	0.6	0.08			
0.07	0.06	0.06	0.11	0.04	0.11	0.06	0.09	0.09	0.6	0.08			
0.1	0.07	0.1	0.08	0.08	0.15	0.11	0.12	0.1	0.07	0.09			
0.1	0.07	0.09	0.07	0.06	0.19	0.11	0.16	0.1	0.09	0.08			
0.11	0.06	0.08	0.08	0.06	0.17	0.11		0.09	0.11	0.08			
0.08	0.07	0.1	0.07	0.07	0.21	0.1	0.16	0.09	0.1	0.08			
	0.04	0.08	0.05	0.03	0.19	0.17	0.18	0.14	0.13	0.14			
0.05	0.09	0.08	0.13	0.05		0.11	0.09	0.1	0.1	0.1			
0.08	0.07	0.06	0.12	0.08	0.16	0.09	0.13	0.1	0.16	0.08			
0.08	0.09	0.1	0.13	0.05	0.2	0.1	0.13	0.06	0.13	0.07			
0.06	0.06	0.08	0.08	0.06	0.19	0.12	0.18	0.12	0.09	0.1			
0.06	0.06	0.08	0.08	0.06	0.19	0.12	0.18	0.12	0.09	0.1			
0.08	0.07	0.09		0.06	0.15	0.11	0.19	0.1	0.11	0.11			
0.06	0.07	0.08	0.12	0.05	0.16	0.1	0.12	0.1	0.14	0.09			
0.05	0.05	0.12	0.19	0.04	0.2	0.09	0.11	0.12	0.08	0.08			
0.06	0.07	0.07	0.06	0.04	0.14	0.1	0.33	0.07	0.08	0.06			
0.09	0.06	0.08	0.08	0.08	0.2	0.13		0.1		0.09			
0.08	0.05	0.08	0.08	0.04	0.39	0.08	0.14	0.08	0.08				
0.06	0.1	0.09	0.07	0.03	0.21	0.1	0.13	0.1	0.12	0.09			

FIG.11-44B

0.093333333	GRM3	0.05	0.06	0.1	0.04	0.04	0.13	0.08
0.092777778	HTR4	0.03	0.06	0.12	0.09	0.07	0.16	0.07
0.092352941	GCC	0.07	0.07	0.12	0.11	0.14	0.14	0.06
0.091666667	HTR1B	0.08	0.08	0.07	0.03	0.03	0.16	0.08
0.090588235	JAM2	0.06	0.07	0.13	0.05	0.05	0.15	0.08
0.090588235	GPR57	0.08	0.09	0.08	0.03	0.04	0.19	0.08
0.09	CXCL9	0.06	0.06	0.07	0.02	0.02	0.13	0.05
0.089444444	NTS	0.08	0.08	0.08	0.04	0.05	0.14	0.08
0.089411765	IAN4L1	0.09	0.08	0.16	0.04	0.03	0.13	0.08
0.089375	MD-2	0.08	0.1	0.08	0.03	0.04	0.17	0.07
0.088888889	RFRP	0.1	0.09	0.08	0.07	0.06	0.17	0.07
0.088823529	ALDH3B1	0.07	0.06	0.1	0.05	0.08	0.14	0.08
0.088823529	ALDH3B2	0.07	0.06	0.1	0.05	0.08	0.14	0.08
0.088823529	CAMLG	0.07	0.08	0.09	0.03	0.04	0.14	0.06
0.088823529	NR5A2	0.09	0.07	0.1	0.06	0.07	0.14	0.12
0.088333333	GADD45A	0.07	0.09	0.07	0.03	0.04	0.16	0.06
0.088125	TACR1 vL	0.06	0.06		0.02	0.04	0.15	0.04
0.087222222	CD1C	0.07	0.08	0.1	0.03	0.03	0.16	0.05
0.087058824	TFPI2	0.06	0.07	0.09	0.03	0.04	0.13	0.06
0.086666667	SNX4	0.06	0.08	0.06	0.03	0.05	0.18	0.08
0.086470588	IL16	0.04	0.07	0.1	0.04	0.06	0.16	0.08
0.085882353	ANXA4	0.07	0.09	0.11	0.05	0.06	0.17	0.08
0.085625	CHRM2	0.06	0.08	0.07	0.04	0.05	0.15	0.05
0.085294118	NCOA6IP	0.06	0.06	0.11	0.05	0.12	0.17	0.08
0.085	CXCL11	0.03	0.06	0.06	0.07	0.14	0.11	0.05
0.085	IL21	0.08	0.05	0.08	0.02	0.03	0.13	
0.084705882	NTF5	0.08	0.08	0.1	0.04	0.04	0.15	0.09
0.08444444	COASTER	0.05	0.06	0.07	0.03	0.04	0.17	0.07
0.084117647	IRAK3	0.06		0.09	0.04	0.05	0.13	0.06
0.083888889	ADRB2	0.08	0.08	0.11	0.05	0.07	0.15	0.07

FIG.11-45A



0.06	0.05	0.08	0.07	0.04	0.15	0.1	0.4	0.07	0.1	0.06			
0.04	0.06	0.09	0.12	0.03	0.15	0.08	0.13	0.11	0.16	0.1			
0.07	0.05	0.08	0.07	0.06	0.13	0.12		0.09	0.13	0.06			
0.07	0.06	0.09	0.07	0.05	0.12	0.12	0.22	0.13	0.09	0.1			
0.07	0.06	0.09	0.13	0.04	0.24	0.13		0.07	0.07	0.05			
	0.08	0.09	0.08	0.04	0.13	0.09	0.17	0.1	0.09	0.08			
0.05	0.04	0.06	0.08	0.03	0.39	0.09	0.24	0.07	0.11	0.05			
0.06	0.07	0.09	0.07	0.05	0.14	0.09	0.16	0.17	0.09	0.07			
0.09	0.04	0.08	0.07	0.05		0.12	0.17	0.09	0.14	0.06			
0.07	0.08	0.08		0.06	0.16	0.12		0.1	0.11	0.08			
0.07	0.08	0.09	0.07	0.05	0.13	0.1	0.12	0.08	0.11	0.06			
0.08		0.08	0.09	0.05	0.17	0.1	0.12	0.09	0.09	0.06			
0.08		0.08	0.09	0.05	0.17	0.1	0.12	0.09	0.09	0.06			
0.08	0.05	0.08	0.07	0.03	0.18	0.13	0.14		0.12	0.12			
0.08	0.06	0.16	0.06	0.06		0.09	0.15	0.07	0.08	0.05			
0.08	0.07	0.09	0.07	0.07	0.14	0.11	0.15	0.11	0.09	0.09			
0.04		0.07	0.07	0.05	0.23	0.12	0.16	0.09	0.11	0.1			
0.06	0.06	0.08	0.09	0.04	0.17	0.11	0.16	0.09	0.08	0.11			
0.06	0.07	0.09	0.07	0.14	0.16	0.1	0.16		0.08	0.07			
0.05	0.09	0.07	0.12	0.05	0.14	0.1	0.1	0.06	0.13	0.11			
0.08	0.08		0.12	0.05	0.17	0.07	0.1	0.06	0.13	0.06			
0.07	0.06	0.07	0.06	0.06		0.11	0.18	0.07	0.07	0.08			
0.05	0.06	0.07		0.04		0.12	0.2	0.13	0.1	0.1			
0.05	0.08	0.06		0.04	0.12	0.08	0.09	0.08	0.13	0.07			
0.04	0.04		0.08	0.07	0.2	0.13	0.1	0.08	0.1				
	0.06	0.05	0.05		0.22	0.11	0.15	0.08		0.08			
0.08	0.05	0.1	0.08	0.06		0.08	0.14	0.09	0.09	0.09			
0.11	0.07	0.07	0.1	0.04	0.15	0.11	0.1	0.08	0.12	0.08			
0.07	0.05	0.08	0.06	0.03	0.23	0.11	0.14	0.07	0.1	0.06			
0.08	0.05	0.08	0.09	0.07	0.14	0.08	0.12	0.07	0.07	0.05			

FIG. 11-45B

0.08375	GABRQ	0.04	0.05	0.06	0.04	0.04	0.12	0.08
0.083529412	HSOBRGRP	0.06	0.09	0.09	0.02	0.03	0.13	0.06
0.082941176	MTNR1A	0.06	0.08	0.09	0.04	0.04	0.16	0.05
0.082777778	GABRA5	0.07	0.08	0.08	0.04	0.05	0.15	0.06
0.0825	IL1RN	0.07	0.07	0.09	0.04	0.06	0.14	
0.081875	FAF1 v1	0.06	0.07	0.08	0.03	0.03	0.13	0.07
0.081875	FAF1 v2	0.06	0.07	0.08	0.03	0.03	0.13	0.07
0.081764706	HSD11B2	0.07	0.08	0.09	0.02	0.04	0.16	0.06
0.081764706	TIMP4	0.07	0.08	0.09	0.04	0.04	0.15	0.09
0.081111111	GAD2	0.05	0.06	0.07	0.03	0.04	0.15	0.06
0.080666667	STAT4	0.07	0.09	0.09	0.04			0.07
0.08	PDGFC	0.09	0.07	0.07	0.02	0.03	0.15	0.06
0.08	ZIC2	0.06	0.08	0.09	0.02	0.03	0.16	0.06
0.079444444	BF	0.07	0.08	0.1	0.04	0.05	0.15	0.06
0.079411765	IL15	0.06	0.08	0.09	0.03	0.04	0.15	0.07
0.078823529	BCL2A1	0.06	0.07	0.11		0.06	0.15	0.08
0.078125	TDO2	0.07	0.08	0.09	0.05	0.05		0.06
0.076875	LEPR	0.07	0.07	0.12	0.02	0.03	0.12	0.06
0.076470588	RORA v1	0.07	0.09	0.08	0.04	0.03	0.14	0.09
0.075882353	GH1 v1	0.03	0.05	0.05		0.03	0.11	0.04
0.075882353	GH2 v1	0.03	0.05	0.05		0.03	0.11	0.04
0.075882353	GH2 v3	0.03	0.05	0.05		0.03	0.11	0.04
0.075	ALDH5A1 v2		0.08	0.09	0.03	0.03	0.11	0.04
0.075	TNFRSF11B	0.04	0.05	0.06	0.03	0.04	0.14	0.05
0.074444444	HRH4	0.05	0.08	0.08	0.02	0.02	0.15	0.04
0.074444444	TBK1	0.05	0.04	0.08	0.04	0.06	0.13	0.09
0.074	A2M	0.05	0.06		0.06	0.05	0.13	0.05
0.073333333	GHITM	0.03	0.05	0.06	0.03	0.03	0.13	0.05
0.071176471	Tar1	0.03	0.06	0.06	0.02		0.16	0.06
0.070555556	NR2E1	0.06	0.06	0.08	0.03	0.03	0.13	0.05

FIG.11-46A

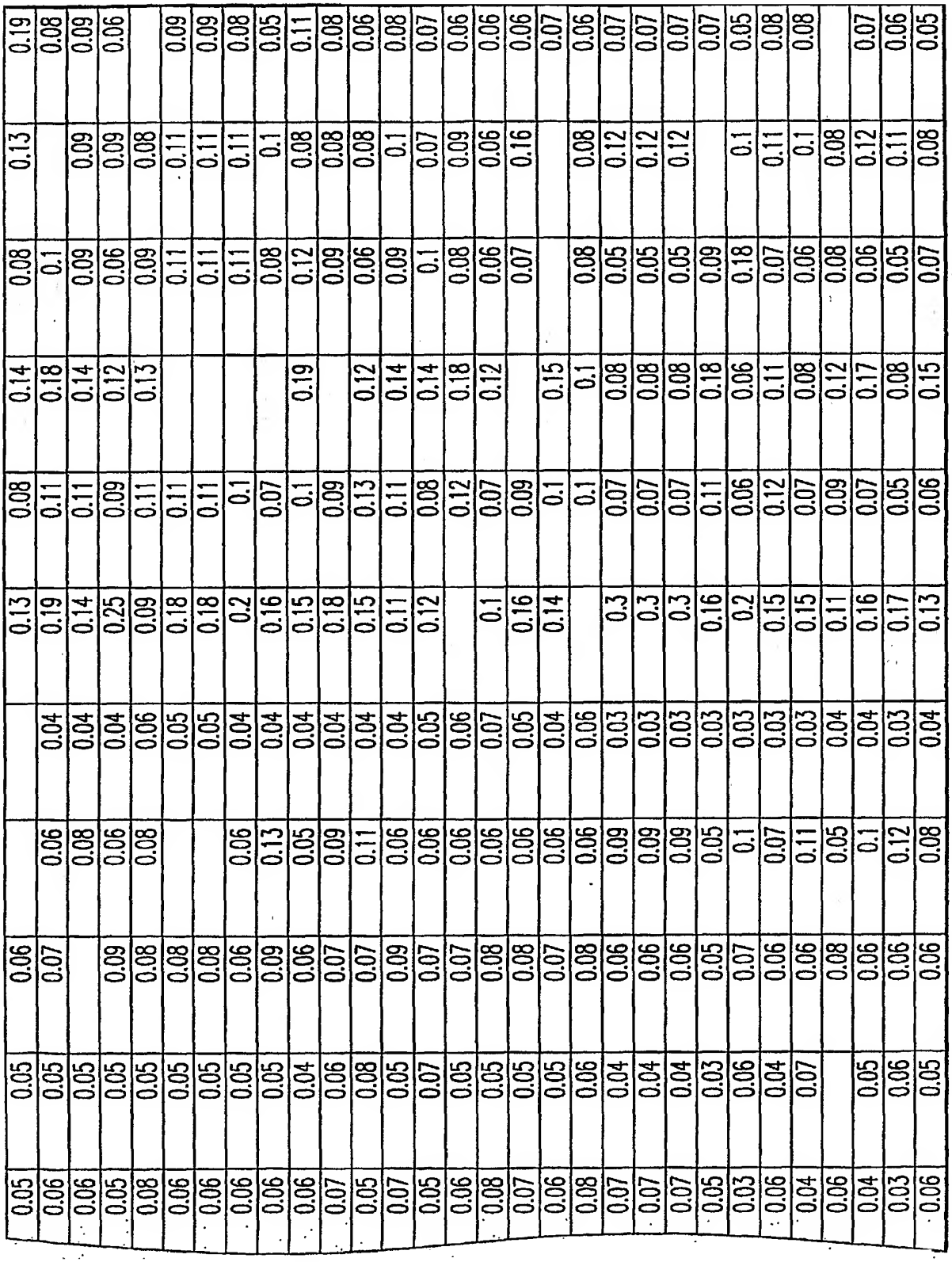
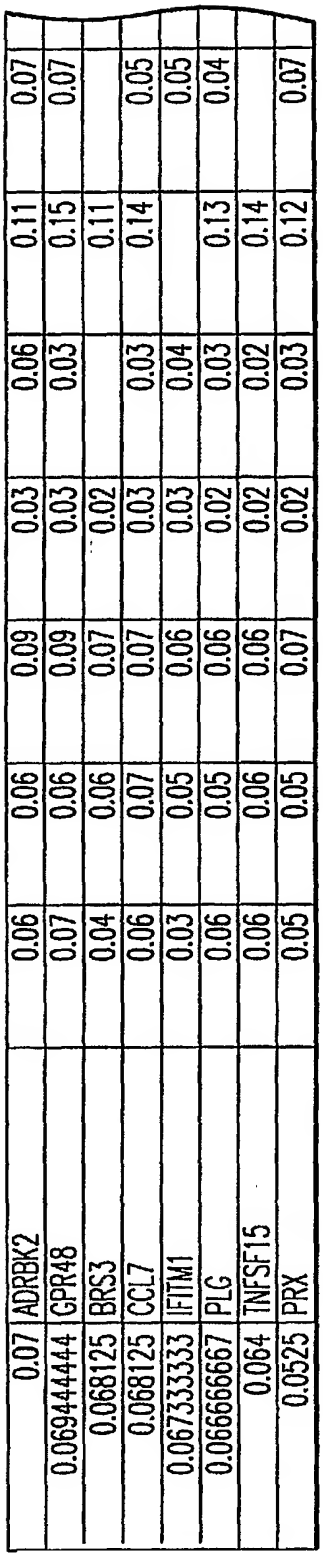
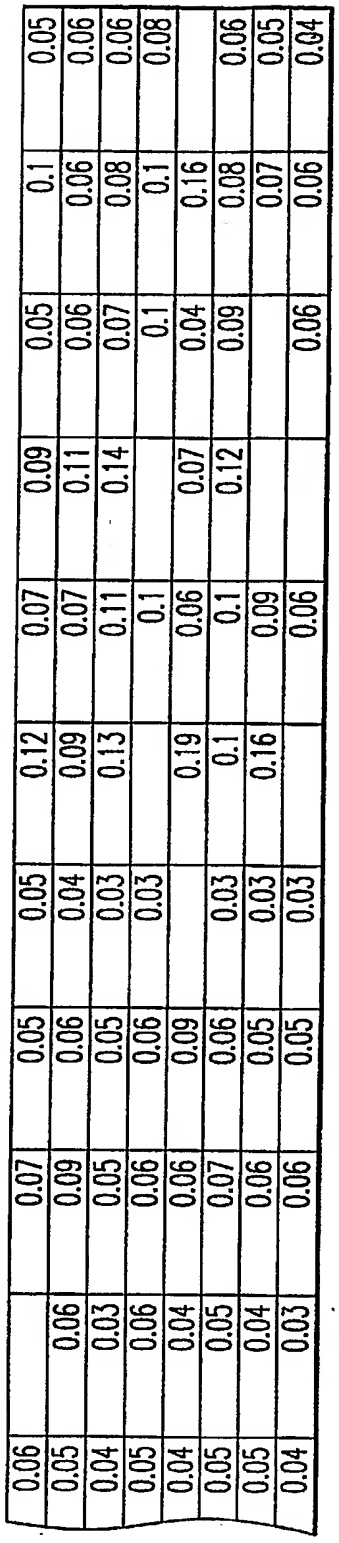


FIG.11-46B



0.07	ADRBK2	0.06	0.06	0.09	0.03	0.06	0.11		0.07
0.069444444	GPR48	0.07	0.06	0.09	0.03	0.03	0.15		0.07
0.068125	BRS3	0.04	0.06	0.07	0.02		0.11		
0.068125	CCL7	0.06	0.07	0.07	0.03	0.03	0.14		0.05
0.067333333	IFITM1	0.03	0.05	0.06	0.03	0.04			0.05
0.066666667	PLG	0.06	0.05	0.06	0.02	0.03	0.13		0.04
0.064	TNFSF15	0.06	0.06	0.06	0.02	0.02	0.14		
0.0525	PRX	0.05	0.05	0.07	0.02	0.03	0.12		0.07

FIG.11-47A



0.06		0.07	0.05	0.05	0.12	0.07	0.09	0.05	0.1	0.05
0.05	0.06	0.09	0.06	0.04	0.09	0.07	0.11	0.06	0.06	0.06
0.04	0.03	0.05	0.05	0.03	0.13	0.11	0.14	0.07	0.08	0.06
0.05	0.06	0.06	0.06	0.03		0.1		0.1	0.1	0.08
0.04	0.04	0.06	0.09		0.19	0.06	0.07	0.04	0.16	
0.05	0.05	0.07	0.06	0.03	0.1	0.1	0.12	0.09	0.08	0.06
0.05	0.04	0.06	0.05	0.03	0.16	0.09			0.07	0.05
0.04	0.03	0.06	0.05	0.03		0.06		0.06	0.06	0.04

FIG.11-47B

most robust differences in PNI gene expression using rank test

Accession #	gene abbrev	# > 0	# normal in first 4	# normal in last 4
NM_000454	sod1	12	0	3
NM_001828	CLC	12	0	3
NM_014668	GREB1 va	12	0	3
NM_004448	ERBB2	11	3	0
NM_014387	LAT	11	0	3
NM_013447	EMR2 v1	10	3	0
NM_002991	CCL24	10	0	3
NM_000460	THPO	7	3	0
NM_020984	CHAT vR	7	3	0
NM_014369	PTPN18	6	3	0
NM_001781	CD69	4	3	0
NM_001335	CTSW	3	3	0
NM_000620	NOS1	3	3	0
NM_016166	PIAS1	3	3	0
NM_019846	CCL28 v1	3	3	0
NM_000413	HSD17B1	3	3	0

significant in both rank test and parametric tests (.1 level) (female only)

Accession #	Gene Abbreviation
NM_001781	CD69

significant in both rank test and parametric tests (.01 level) (male only)

Accession #	Gene Abbreviation
NM_000460	THPO
NM_014369	PTPN18
NM_000413	HSD17B1

FIG. 12-1

PNI genes

Accession#	Gene Abbrev	Category 2	mean sick	mean well	fold difference
U59286	CXCL11	Immune: Cytokines/Chemokines	0.05	0.1	0.5
NM_000635	RFX2 v1	Transcription Factor	0.545	0.865	0.630057803
XM_029606	MASP v2	Immune: Complement Component	0.1775	0.5175	0.342995169
AF200494	IL1F8	Immune: Cytokines/Chemokines	0.2475	0.3825	0.647058824
AF380185	Tar1	Neuronal: Neurotransmitter Receptor	0.0475	0.103333333	0.459677421
NM_000064	C3	Immune: Complement Component	0.24875	0.426666667	0.583007812
NM_000588	IL3	mmune: Cytokines/Chemokines	0.425	0.76	0.559210526
NM_003490	SYN3	Neuronal: Regulates Neurotransmitter Activity	0.89	0.595	1.495798319
NM_000099	CST3	Protease Inhibitor	1.25125	1.5775	0.79318542
NM_001842	CNTFR*	Immune: Cytokine/Chemokine Receptors	0.27625	0.4275	0.64619883
NM_006521	TFE3	Transcription Factor	0.28375	0.3825	0.741830065
NM_001781	CD69	Immune: Other Immune Function	0.68375	1.2125	0.563917526
NM_018402	IL26	Immune: Cytokines/Chemokines	0.2725	0.655	0.416030534
NM_016118	NYREN18	Immune: Other Immune Function	0.1475	0.216666667	0.68076923
NM_001779	CD58	Immune: Other Immune Function	0.17	0.2175	0.781609195
NM_017457	PSCD2	Endocrine: Regulated by Hormones	0.12875	0.2	0.64375
NM_022817	PER2	Circadian	0.192857143	0.2525	0.763790665
NM_002270	KPNB2	Immune: Other Immune Function	0.198571429	0.145	1.369458131
NM_003382	VIPR2	Neuronal: Neurotransmitter Receptor	0.35	0.255	1.37254902
NM_005546	ITK	Signal Transduction	0.1675	0.2125	0.788235294
NM_000460	THPO	Immune: Other Immune Function	1.0225	1.31	0.780534351
NM_003020	SGNE1	Other Neruoendocrine Function	0.3075	0.235	1.308510638
NM_000450	SELE	Immune: Other Immune Function	0.10125	0.1675	0.604477612
NM_007253	CYP2F8	Endocrine: Hormone Metabolism	0.75375	0.975	0.773076923
NM_003853	IL18RAP	Immune: Regulates Cytokine Activity	0.17375	0.31	0.560483871
NM_000901	NR3C2	Endocrine: Hormone Receptor	0.53375	0.335	1.593283582

*mice that are homozygous for an inactivated CNTF gene develop normally and initially thrive and only late in adulthood exhibit very mild loss of motor neurons with resulting minor muscle weakness.

FIG.12-2

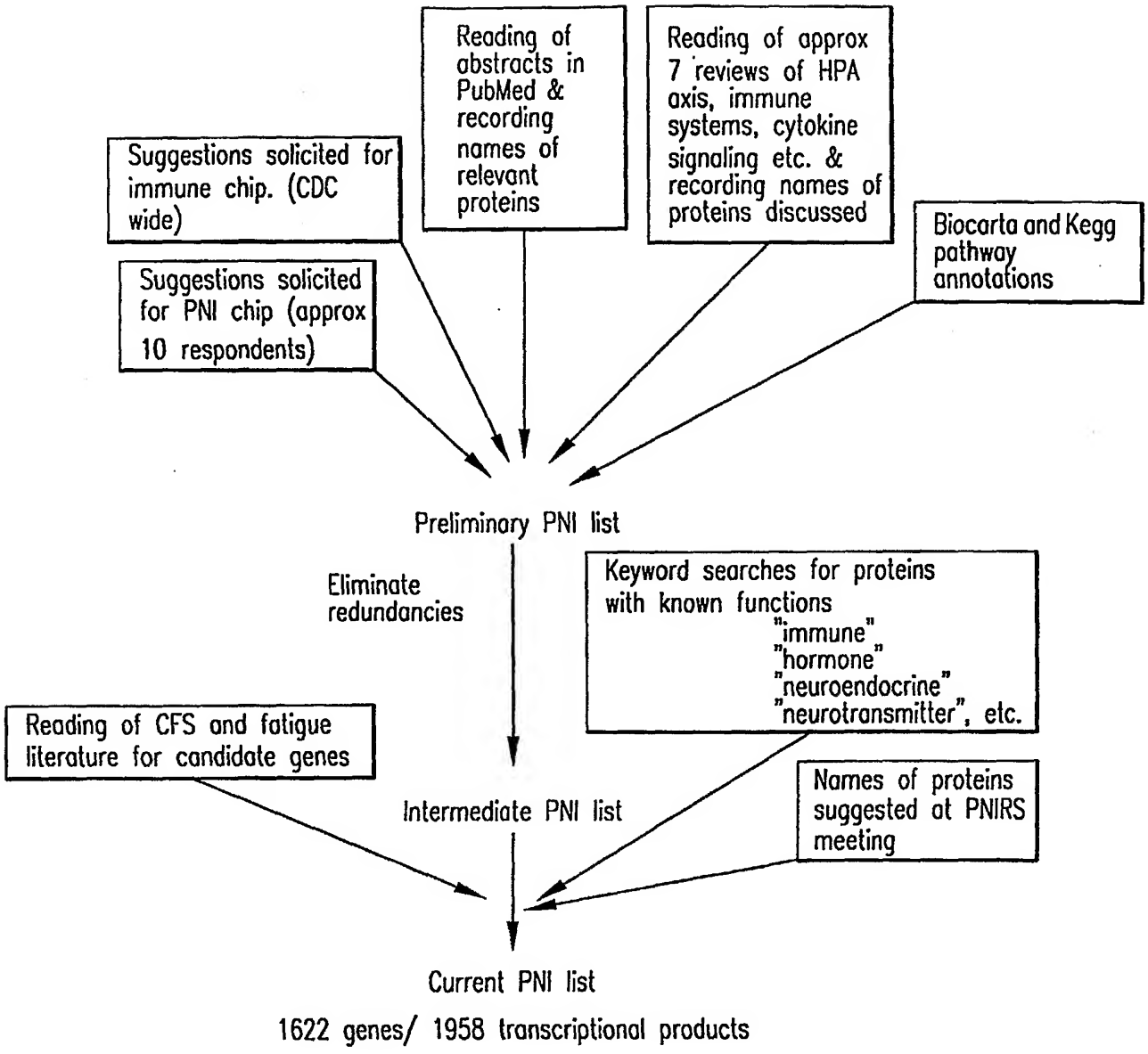

Reading of abstracts in PubMed & recording names of relevant proteins
Reading of approx 7 reviews of HPA axis, immune systems, cytokine signaling etc. & recording names of proteins discussed
Suggestions solicited for immune chip. (CDC wide)
Biocarta and Kegg pathway annotations
Suggestions solicited for PNI chip (approx 10 respondents)
Preliminary PNI list
Eliminate redundancies
Keyword searches for proteins with known functions
"immune"
"hormone"
"neuroendocrine"
"neurotransmitter", etc.
Reading of CFS and fatigue literature for candidate genes
Names of proteins suggested at PNIRS meeting
Intermediate PNI list
Current PNI list
1622 genes/ 1958 transcriptional products

FIG.13-1

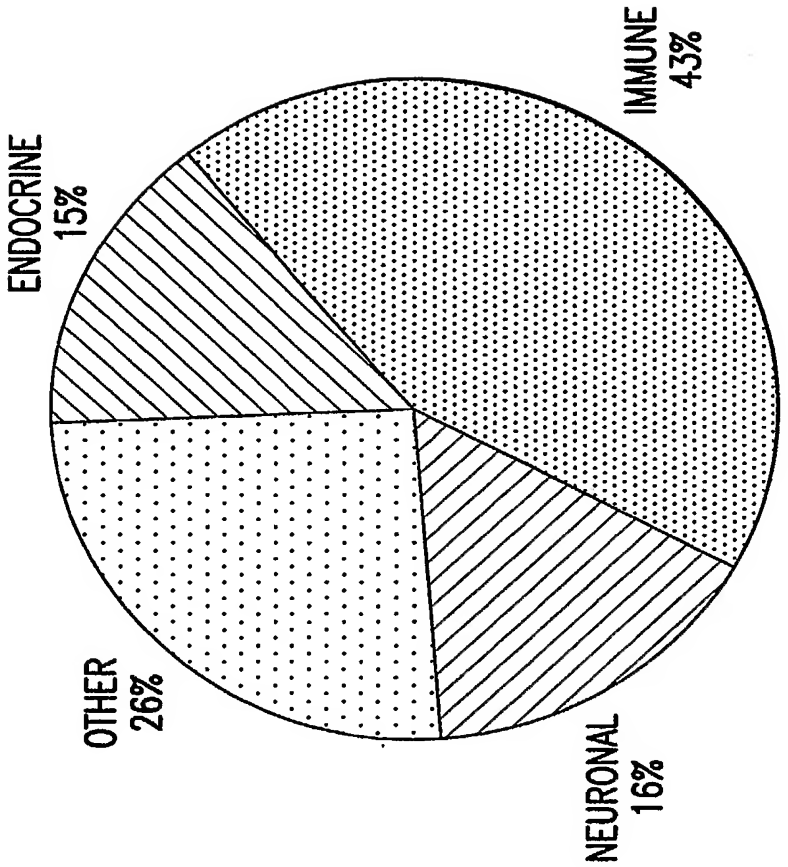


FIG.13-2

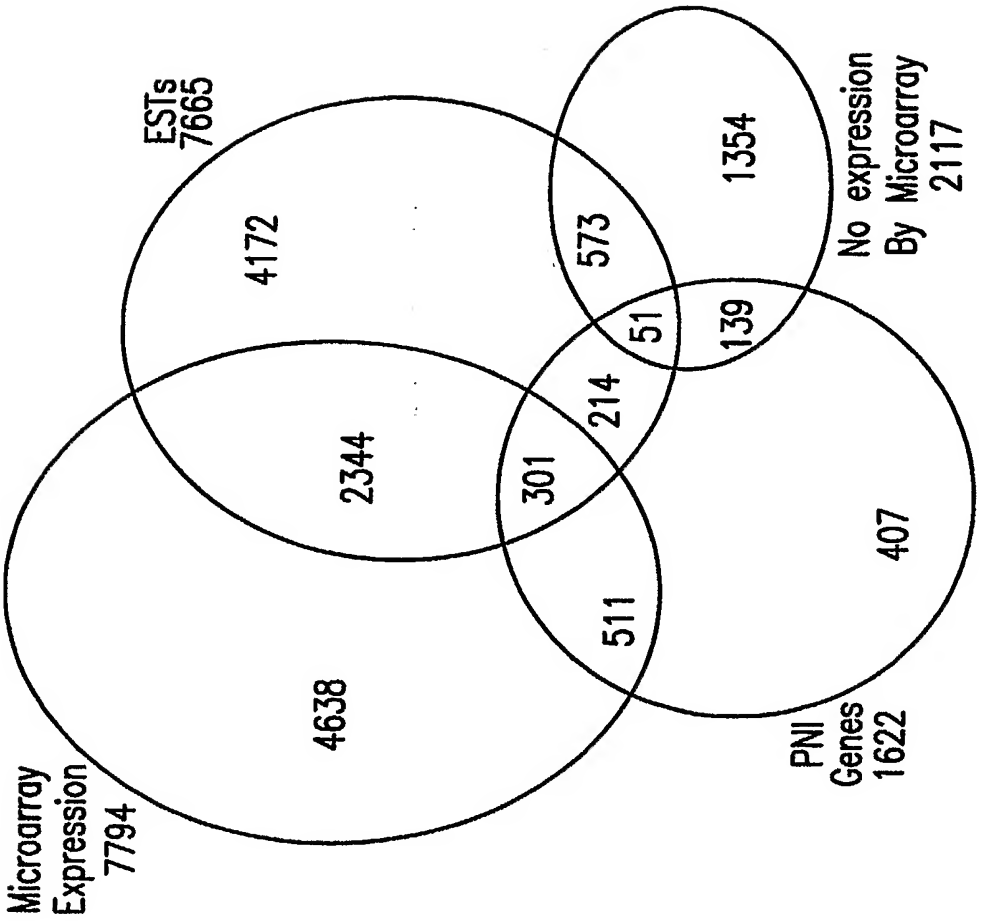
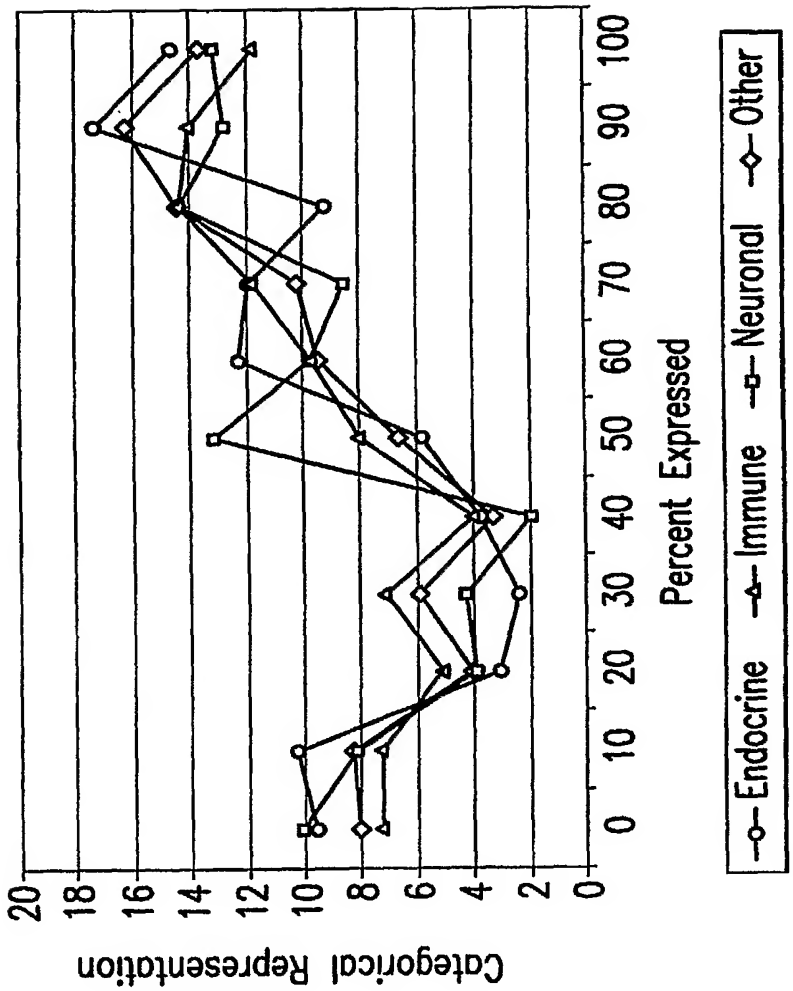

ESTs
7665
4172
2344
Microarray
Expression
7794
4638
PNI
Genes
1622
511
407
573
1354
No expression
By Microarray
2117
51
139
214
301

FIG.14



Percent Expressed = Number of arrays evidencing expression of a given gene/Number of arrays for which data is available
Categorical Representation = Number of genes at that Percent Expressed level/Number of genes in the category

FIG.15

Multivariate

Correlations

	log2sARM NOMM1	log2sARM NOMM2	log2sARM NOMM3
log2sARM NOMM1	1.0000	0.8109	0.7771
log2sARM NOMM2	0.8109	1.0000	0.7931
log2sARM NOMM3	0.7771	0.7931	1.0000

3758 rows not used due to missing values.

Scatterplot Matrix

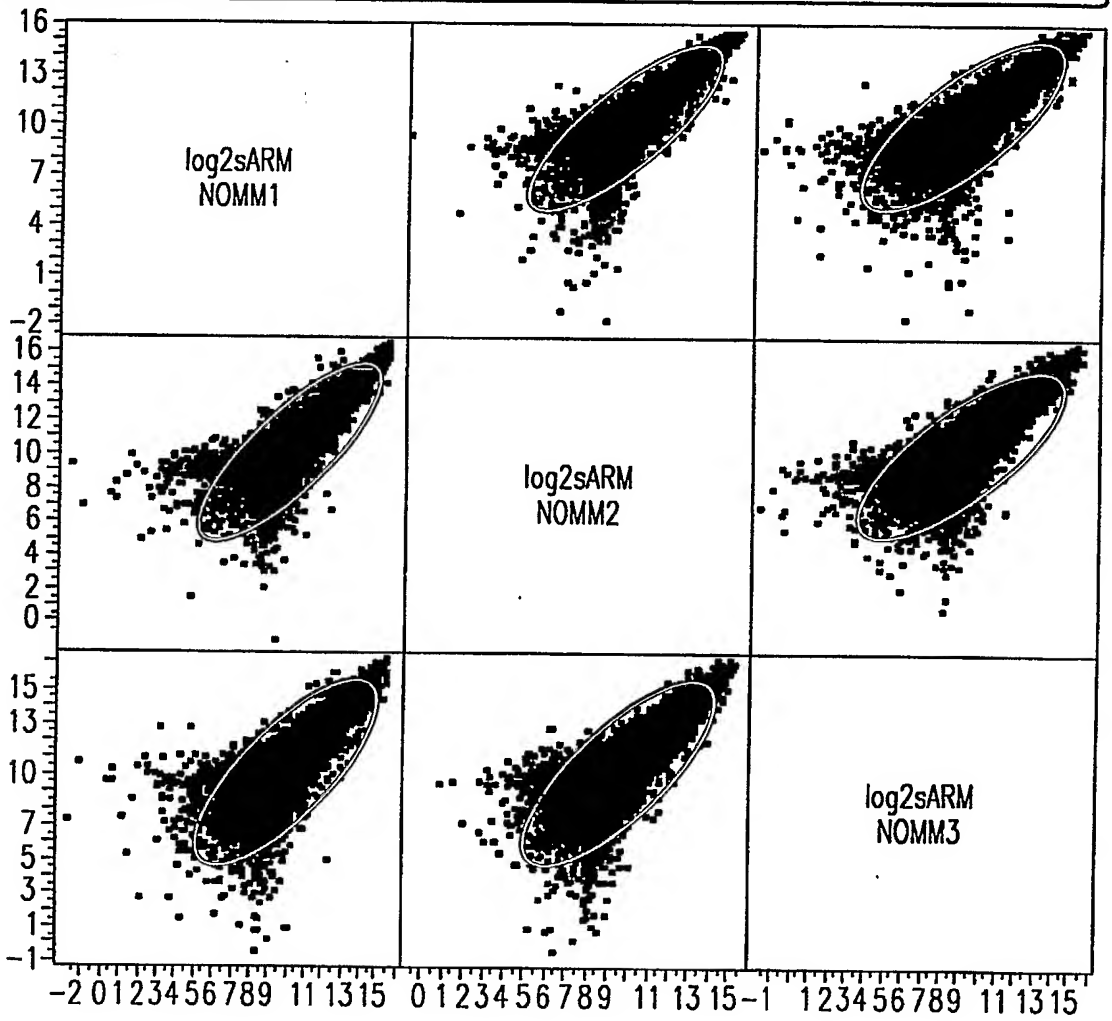


FIG. 16

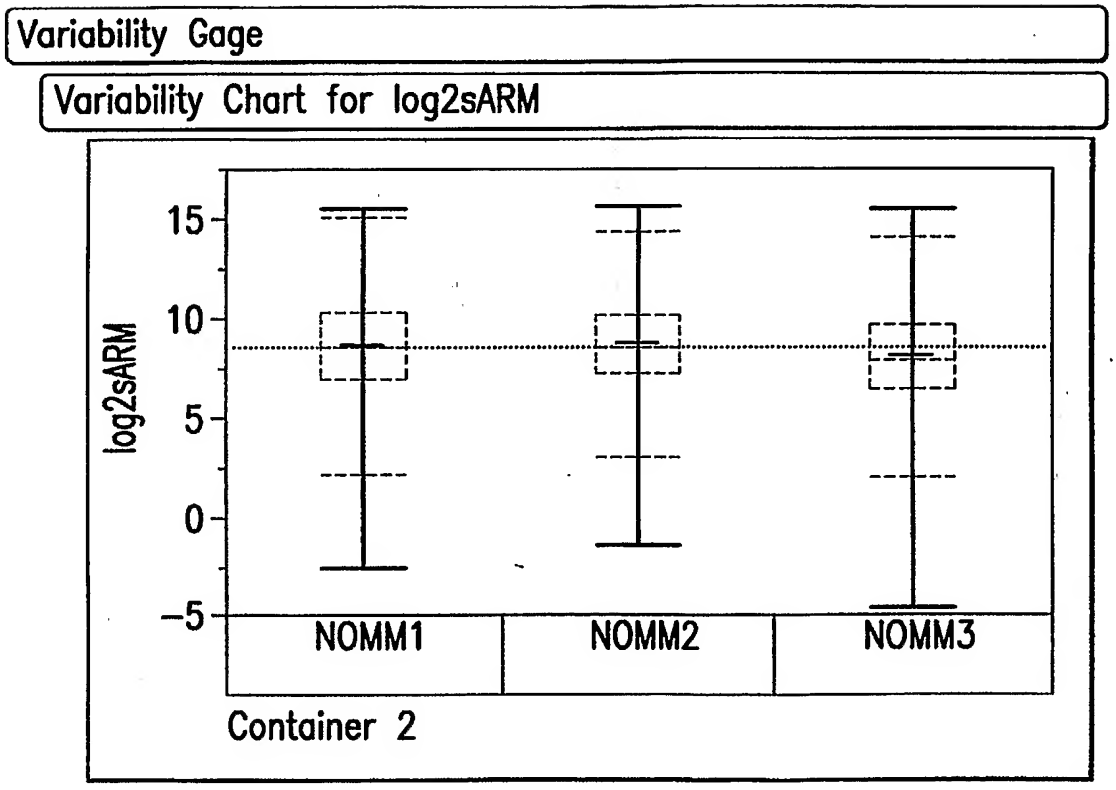

Variability Gage
Variability Chart for log2sARM
log2sARM
15
10
5
0
−5
NOMM1
NOMM2
NOMM3
Container 2

FIG.17